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The Macintosh® Magazine

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IDG Communications

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When we introduced Microsoft® Word six years ago, we weren't planning on making history.

We had just one goal, and a fairly simple one at that: to make a word processor that suited people's needs.

Then again, we knew that the people we wanted to suit were a wildly diverse, independent lot: Mac® users. So it made sense to let them tell us exactly what to put into Word.

Which they did.

First, there were some folks who didn't like tabbing much. Fair enough. For them, we developed Tables—an easier way to set up side-by-side paragraphs, columns of numbers, even forms. No tabs. No hassle.

Then we heard from a few more people. "Love the Tables gig," they said. "Now, about this text-numbers-graphics combo all in one document..."

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Then there were those senders of mail, who didn't want to click-click-click-click-click-click-click.

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As it happens, listening to what Mac users want is a pretty good way to design software.

How else can we explain Word version 4.0 being the most popular word processor in Mac history?

And those cards and letters are still coming. "Listen," someone'll say. "In case you're working on the next Word..."

Which we are. In fact, if you've got some input for us, feel free to drop us a line. Or if you'd like to find out more about Word, call us at (800) 541-1261, Department N24.

Our goal is still simple: to make Word the best word processor around. With the latest technology—translated into human terms, of course.

After all, we're only making history because we make word processors the way you like 'em.

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Send those cards and letters to: Microsoft Word for Macintosh Development Team, One Microsoft Way, Redmond, Washington 98052-6399. Customers in Canada, call (416) 673-7638. Outside North America, call (206) 936
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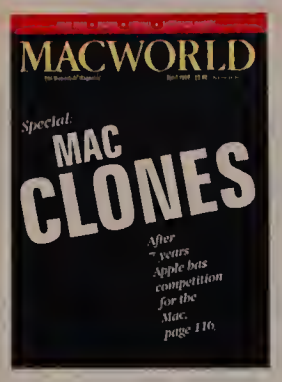

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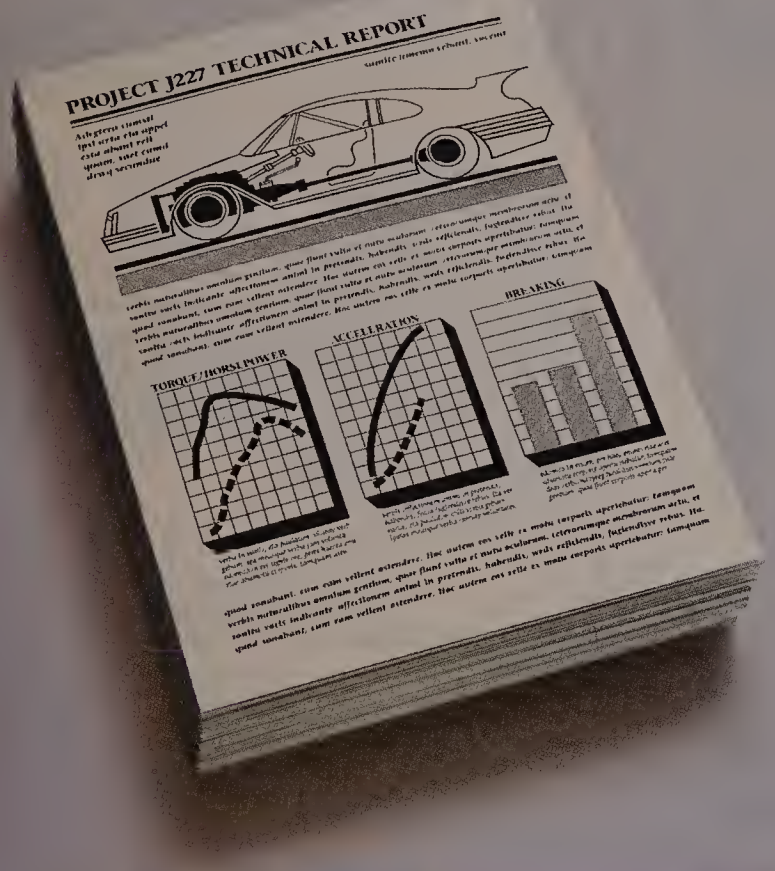

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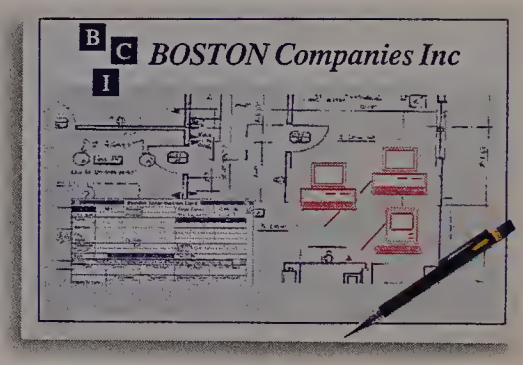

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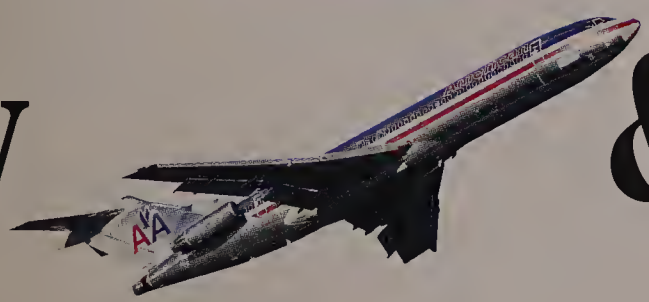

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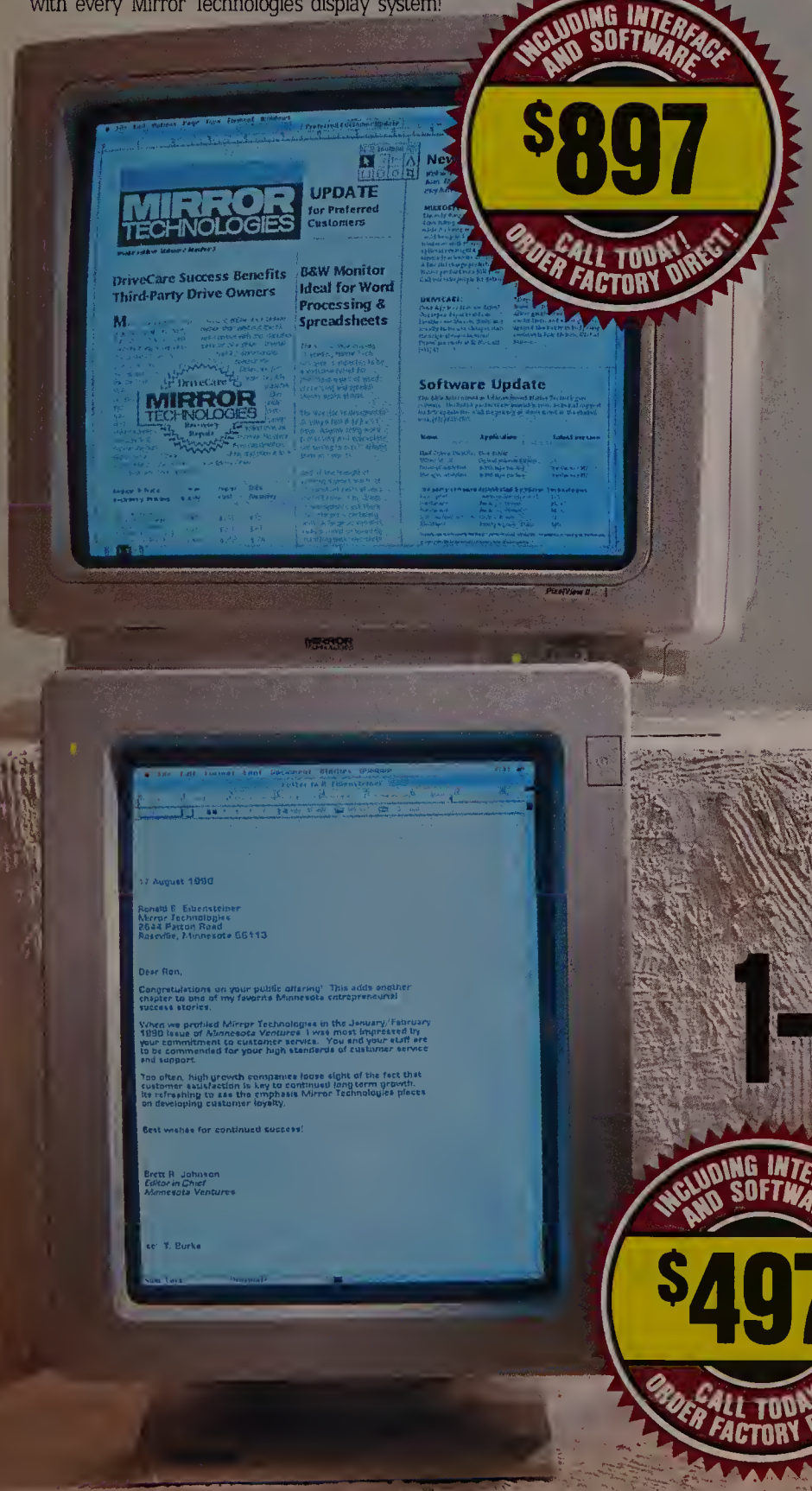
Resolution (dpi)	80	72	72	72
Vertical refresh	75	78	75	74
Pop-up menus	Yes	Yes	Yes	Yes
Enlarged menubar	Yes	Yes	Yes	Yes
Enlarged cursor	Yes	Yes	Yes	Yes
Screen saver	Yes	Yes	Yes	Yes
Screen copy	Yes	Yes	Yes	Yes
Full year warranty	Yes	Yes	Yes	Yes
VideoPaint	No	No	Yes	Yes
DeskPaint v1.5	Yes	Yes	No	No
Tilt and swivel	Yes	Yes	Yes	Yes
Works with Plus, SE, Classic	Yes	Yes	No	No
Dealer markup	No	No	No	No



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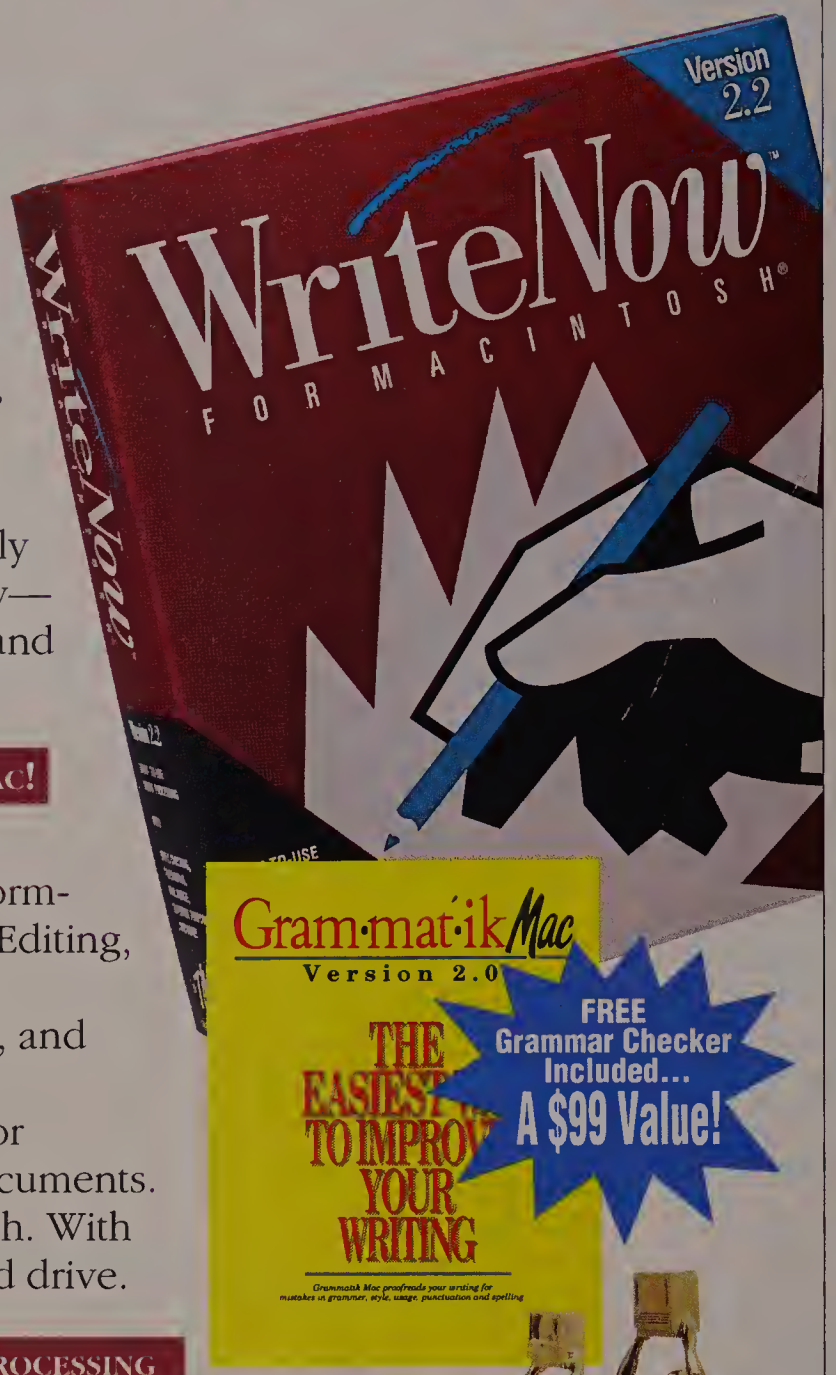

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Grammar Checker *(Bundled)*:	Yes	No	No	No
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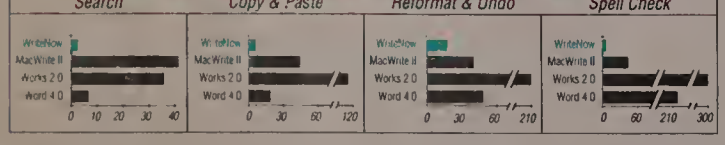

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New Products and Updates Direct press releases and product announcements (by mail or electronically), and shrink-wrapped software upgrades (by mail or courier) to: New Products Editor.
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■ **Library B - "WordProcessing"**
WriteNow from T/maker: WriteNow the fastest. Best pure-writing program available. Has an excellent spelling checker, mail merge, graphics inclusion, footnote and header/footer control. "Wonderful interface and support RTF". *Macuser Magazine.*
Business Letters from Lightning Word Corp.: More than 385 persuasive business letters with interactive personalized editing and also standard legal agreements such as leases, liens and many others.
Sales Letters from Lightning Word: More than 259 professionally written letters to help boost your sales.
InstantResume from Lightning Word: The interactive prompting system automatically personalizes the resume that you chose and drop it in your wordprocessor, giving you many forms of resumes and job-winning letters to choose from.

■ **Library C- "Business Booster"**
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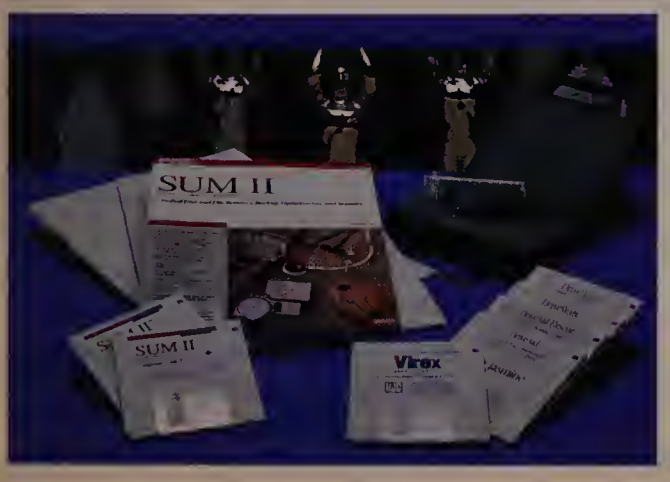

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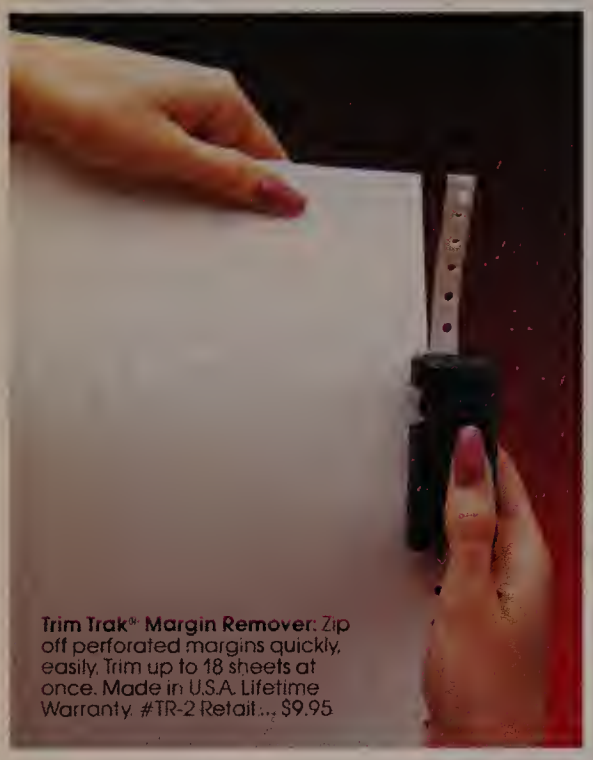

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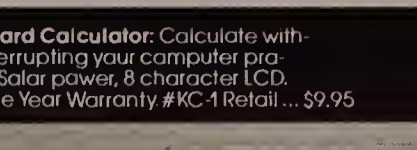

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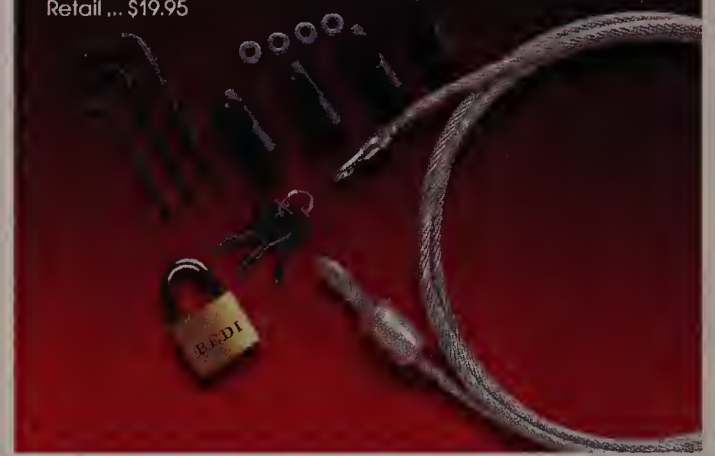

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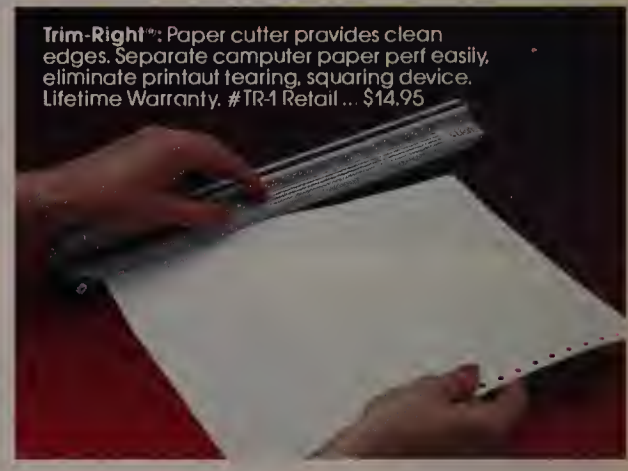

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MacBulletin

Apple Decides to Ship Backlit Portable

Apple has solved the memory-addressing problems that delayed the backlit-LCD version of the Macintosh Portable and will announce and ship the machine soon, an Apple representative said. The backlit Portable will replace the existing version, will cost about $1800 less, and will be able to address 8MB of RAM and work with third-party RAM boards. A model with 2MB of RAM and an internal 40MB hard drive will list for $4199, while a model with 4MB of RAM and the same hard drive will list for $4699. Apple will charge owners of the original Mac Portable about $1050 to add the backlighting feature to their machines if they choose to upgrade.

No Market for Lotus MarketPlace

Saying that Lotus MarketPlace is "at the apex of an emotional fire storm of public concern about consumer privacy," Lotus president Jim Manzi announced plans to cancel publication of CD ROMs containing marketing information about 120 million U.S. consumers, and to discontinue a similar database of marketing information about 7 million U.S. businesses. The MarketPlace information was to be supplied by Equifax and TRW, two large credit bureaus that compile and sell information on businesses and consumers to private companies.

Apple Seeks FCC Approval for Radio Networks

Apple has filed a petition with the Federal Communications Commission asking it to allocate a part of the radio spectrum for high-speed computer communications. If this is approved, Macs could soon be using radio waves—instead of wire-based networks—to communicate.

Radius, Fusion Introduce 68040-Based Accelerators

With Motorola finally shipping production quantities of its 68040 microprocessors, several vendors have announced accelerators using the new chip. Radius recently demonstrated a prototype 68040 accelerator for NuBus Macs and said it expects to announce a final version in the first quarter of 1991. The accelerator is designed to work with Radius's line of graphics products, integrating with its existing calibration, compression, and image-capture offerings. The price, ship date, and name of the product were not set at press time. Also, Fusion Data Systems announced the TokaMac LC, a 68040 accelerator that fits in the Processor Direct Slot of the Macintosh LC. Fusion is planning versions for the IIsi, the IIci, and the SE/30. The TokaMac LC lists for $2995 and was slated to ship in late February. For more information, contact Radius at 408/434-1010, or Fusion's distributor, Quantum Leap Systems, at 619/457-0781.

At the ACIUS Supermarket

ACIUS has grown from a one-product shop to one-stop shopping. Hard on the heels of 4DWrite, 4DCalc, and other 4th Dimension add-ons, ACIUS has announced a database server that it claims runs 30 to 100 times faster than multiuser 4D. Several people can modify a database structure simultaneously, even while clients are changing the database's contents. 4D Server has features common on minicomputers, such as priority levels for clients. ACIUS is also developing a tool kit for using MacroMind Director, RadiusTV, Bright Star's InterFACE, and several other multimedia products inside 4D, and externals to communicate with Northern Telecom digital telephone switches. Pricing was not set at press time. For more information, contact ACIUS at 408/252-4444.

The Color of Control

Astral Development's first Mac product, the gray-scale image editing package Picture Publisher, emphasizes scanner and output-device calibration, even providing calibrator strips to scan in and output files to test with a densitometer. Astral's next product for the Mac, Picture Publisher Plus, is a color photo-editing package that will support color separation, blends, color masking, transparency, and other features appropriate for 32-bit color. It will provide tools for calibrating color scanners, and controls for four-color printing, including undercover removal, gray-component boost, and dot-gain and ink-contamination settings. Picture Publisher lists for $295, and Plus will list for $695 or $795. Astral Development is at 603/432-6800.

Oracle Does Buttons

Oracle has licensed the HyperCard work-alike Plus from Spinnaker Software to incorporate in Oracle Card, a point-and-click application-development system and front end to Oracle servers. Oracle Card will support standard Plus features such as color picture fields, buttons that trigger scripts, and

(continues)

XCMDs. Macintosh and Windows versions, which can share Oracle Card applications, will list for $299 (documentation for programmers will cost extra); Oracle plans to develop a similar product for OS/2, OpenLook, Motif, and Nextstep. For more information, call Oracle at 415/506-7000.

New Master for the Finder

Tactic Software is launching its first home-grown product, MasterFinder, which combines most features of DiskTop, On Cue, and HandOff. It can search for files by name, type and creator, and so on, and you can batch-catalog volumes and search them when they are offline. It can show four open volumes or folders in side-by-side scrolling windows, so you can move files around easily, and it can show an outline of all nodes on a network, even across bridges. You can assign frequently used folders or files to a launch menu, and specify an application to open files that were created by an application you don't have. MasterFinder comes in both DA and application form and lists for $99. For more information, contact Tactic at 305/378-4110.

New Vitamins for Virex

Virex 3.0 users can key in codes supplied by Microcom each time a new virus is discovered, to update the utility's detection capability. With previous versions you had to wait for Microcom to ship an update. Version 3.0's INIT can now repair as well as detect virus-affected files, and the new version can batch-search folders and ignore nonexecutable files. Virex 3.0 lists for $99.95. For more information, contact Microcom at 919/490-1277.

Worlds of Information

Educational software developer PC Globe is preparing Mac USA, a collection of demographic, economic, and many other kinds of information about the United States that does simple thematic mapping and bar charting. For example, you could chart average income in all the major cities in Texas, or create a colored map showing percent of voter turnout in the last election. Mac USA will list for $69. Future products will have data and maps for the whole world and provide a way to add your own data to the database. For more information, contact PC Globe at 602/730-9000.

Reset Preferences

Preferred Software appears to be emerging from its time of trouble, after passing through two management purges. Preferred still publishes DAtabase, Vantage, Exposure (now Exposure Pro), and several other products, and is working on new products. FlashCrypt is intended to be a convenient, high-speed encryption tool. DoubleTalk is a full-featured telecommunications program with a scripting language. DoubleTalk can be used to build a BBS, can be driven from inside HyperCard, and has a proprietary Zmodem protocol that Preferred claims is faster than standard Zmodem. Later, DoubleTalk will have a run-time and a Windows version, and support modemless communications over Ethernet (and maybe AppleTalk); the modemless version could be a platform to build an electronic-mail package on. DoubleTalk 1.1 is shipping now at $149.95 ($249.95 for two copies). Pricing and ship dates for FlashCrypt and later versions of DoubleTalk have not been set. For more information, call Preferred at 901/683-3383.

16-ppm Kodak Printer Is Also a Copier

Eastman Kodak has begun shipping the Ektaplus 7016PS, a network printer that produces 16 pages per minute and can double as a 6-ppm convenience copier. The printer can also connect to as many as four networks. The Ektaplus 7016PS comes with one serial and one parallel port but can be upgraded to four ports, including a LocalTalk connector. It comes with a PostScript controller with 4MB of RAM and also includes IBM Proprinter, HP-PCL, HPGL, and Epson and Diablo printer emulations. The Ektaplus 7016PS lists for $6995. For more information, contact Kodak at 800/344-0006.

NEC Ships Monitor with Reduced Magnetic Fields

NEC Technologies is offering a 14-inch color monitor designed to reduce the emission of possibly hazardous VLF and ELF magnetic fields. The NEC MultiSync 3DS works with a wide variety of personal computers, including the Mac II series. The monitor's design includes extra shielding, a cancellation yoke, and grounding wires to reduce the magnetic fields. Its suggested retail price is $1099. For more information, call NEC at 708/860-9500.

The Virtual Vise

SuperDisk, from new kid on the block Alysis, automatically compresses files every time you save to fit more files on a hard disk with no loss of data. SuperDisk is an INIT-cdev combo that compresses any file or the contents of any folder or volume that has *.s* following the name, and it has optional password-protection as well. Alysis claims that SuperDisk will run about four to five times faster than DiskDoubler, and about as fast as hardware-based DoubleUp. SuperDisk will list for $89. For more information, contact Alysis at 415/566-2263.

Macintosh LC Supports VGA Monitors

Apple recently revealed that the Macintosh LC can support the VGA monitors common in the IBM PC market, giving users access to less expensive color displays of somewhat lower than Macintosh quality. Apple said that the LC supports the VGA standard's different scan rate and that the only requirement is a cable specifically designed to make the connection. Apple said it expects such cables to be available from third-party vendors. ■

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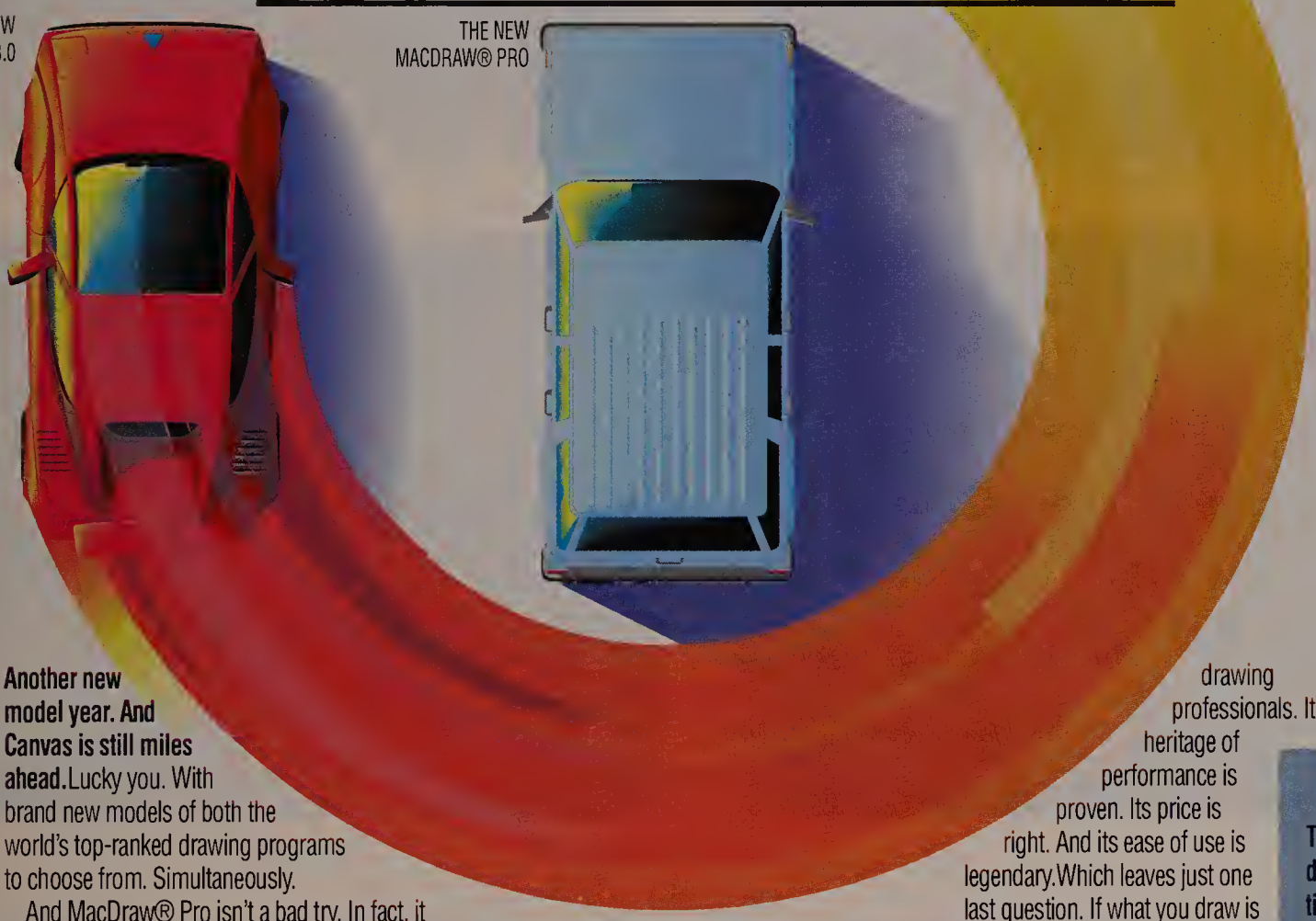

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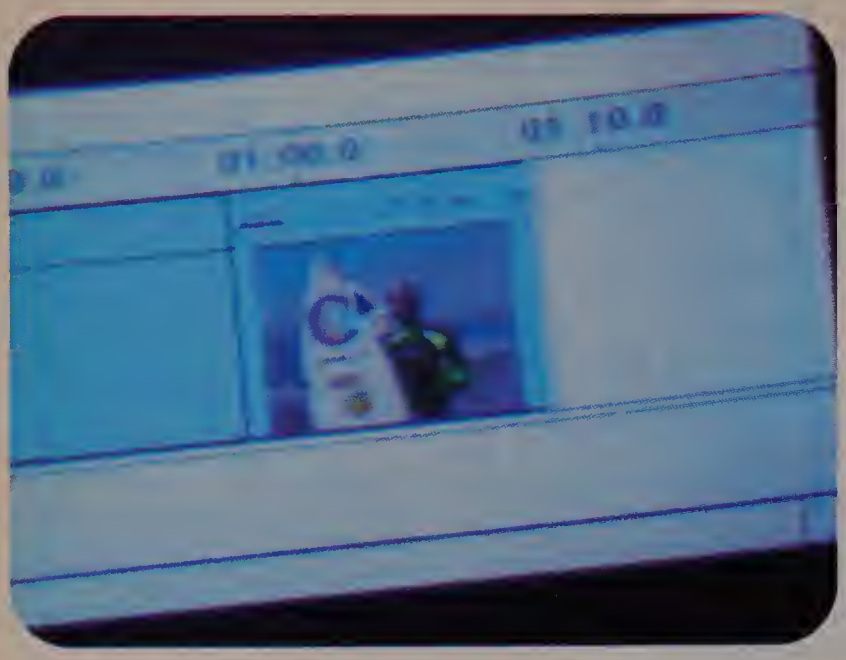

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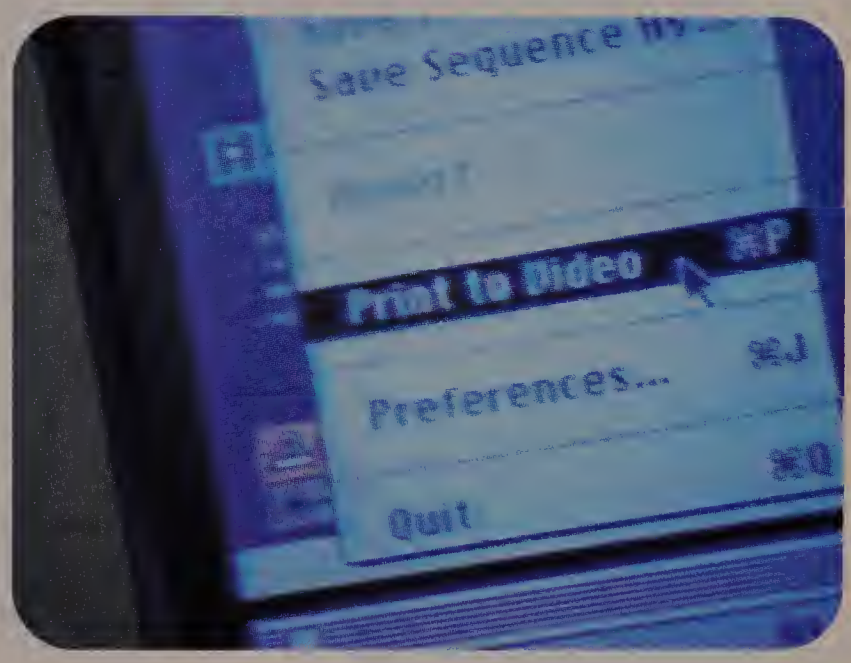

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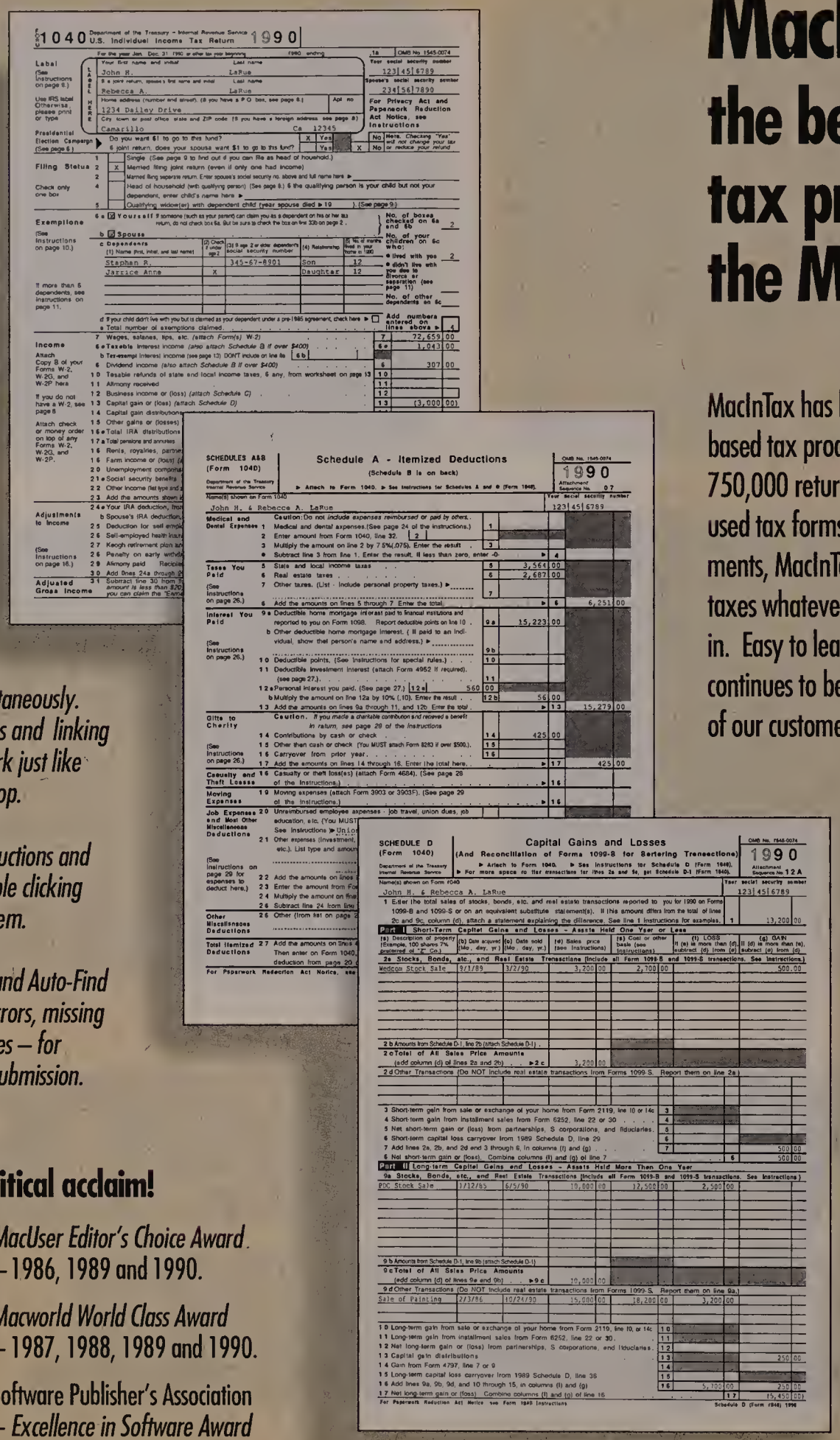

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BY JERRY BORRELL

For a week last January, San Francisco had the feeling of the world's largest computer flea market. Not since the heyday of Jim Warren's Computer Faire (where Steve and Steve first introduced the Apple 1 to the public) has the City by the Bay been so dominated by one event.

There was no sign of an economic recession at the exposition as visitors thronged the two major exhibit halls, gawking at the latest products and purchasing enough computer equipment to outfit a small city. Throughout the four days there were lines at Dr. Mac, ComputerWare, Educorp, Computer Selection, and at other booths where Mac products were actually sold. And no wonder—at ComputerWare you could buy a 100MB hard drive for $699, a 195MB model for $999, Adobe Photoshop for $475, T/Maker's SmartBundle for $199. A festive atmosphere prevailed. People waddled out with shopping bags full of products. Marketeers barked carnival style at passersby. Microsoft cheerleaders had visitors chanting enthusiastically for product giveaways. Several companies offered product training to groups of attendees on the show floor. There were even some Classics and LCs in evidence. Developers forgot to curse the exposition's organizers. And Apple, once the center of the Macworld exhibits, seemed lost in the crowd of developers seeking to support the Macintosh. More people than we have ever seen at a Macworld.

Video Products Lead

Announcements made in San Francisco, and those that will precede the August Macworld Expo, show that video is taking a dramatic lead in cutting-edge technology for the Macintosh. Light Source demonstrated its video editing system. Electric Image was showing software (now shipping after kicking around for a couple of years) that's designed to do titling in 3-D for video. Digital F/X announced its intention to produce a software-only version of its award-winning video software. Bravo—selling turnkey systems for more than $20,000 is antithetical to current Mac trends.

SuperMac showed SuperSqueeze, video compression based upon the C-Cube Microsystems microprocessor. E-Machines also announced real-time compression-decompression. A host of smaller developers, led by Commotion, challenged larger companies' leadership in this area with software that accomplishes the same result without a hardware assist. Apple was mum about its video software but demonstrated a Sony product with a built-in video interface that hinted at a future relationship in the video product arena. RasterOps pushed its technology further by introducing a $1000 24-bit board with acceleration and video overlay. The old pioneer, Mass Microsystems, introduced a 24-bit video overlay board with a really neat interface, but one that's a little behind the technology of products from RasterOps and Radius.

RasterOps also stole SuperMac's

thunder by showing a wall of Barco display monitors organized to act individually or to work together in monolithic, single-display fashion. The first shipping products to expand the display capacity of the LC, Classic, and si were shown. Lapis, Mirror, and Ehman had monochrome displays for the Classic. NEC offered a color display for the si. RasterOps, in another first, had a 24-bit board with built-in acceleration for the si—a real problem, given that machine's poor power supply. Radius offered a connection for the Pivot monitor to the LC, but no two-page displays for the newest Macs. SuperMac showed its 8-bit processor direct slot–based board.

Dynamac showed a flat panel LCD screen for the si that, for some, makes that computer a portable (so did John Sculley, in a cheap shot at his own portable). In Focus Systems showed its latest LCD for overhead projectors.

Vertical Markets

One of the subtle but rewarding aspects of the show was the richness of products—the breadth of the offerings

(continues)

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†Restrictions apply. Please contact La Cie for complete warranty information.

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6

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Frankly, there's been a lot of talk about La Cie hard drives.

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in vertical markets. On Technology and ASD Software showed multiuser calendaring products that work over networks that are the first generation of System 7.0–related products. Mitch Kapor's (On) product looks like a real hit. Psybron and PMC Telesystems had new versions of their single-user calendars (CalenDAr, Rendezvous Plus) while Pastel Development showed a new calendar cum database (Manager).

Ethernet Products Proliferate

A reflection of the fact that almost all networked Macintosh users are beginning to suffer from network slowdowns is that many companies offered Ethernet connections to AppleTalk, including National Semiconductor, Asanté, Tri-Data (with some of the first third-party Ethernet boards for the si and LC), Shiva, Dove, Everex, Dayna, and Cayman. These companies rightfully divine that users are demanding more from a network, even if it is only an improvement in printing and sharing electronic mail.

And speaking of mail, Microsoft took the lead at the show with a new version of Microsoft Mail that recaptures some ground from QuickMail and adds a host of network-analysis features rivaled only by Farallon (in the LocalTalk world).

I also saw two new network-analysis products for LocalTalk: LocalPeek from The AG Group and Network SuperVisor from CSG Technologies. A related product from Pharos Technologies is Status Mac, a software product that enables a network administrator to check, for example, all the version numbers of applications on those machines. It's really useful.

A lot of companies—Orchid, Dove, and Cypress Research, for example—are still trying to overcome the prejudice left in the market by Apple's faulty entry into desktop fax (and subsequent abandonment of its product).

Accelerators Aplenty

Now that we have Macs with 68030s, naturally some people will want to have Motorola's just-shipping 68040 processor. Radius, Quantum Leap Systems, and Total Systems are glad to oblige. Additional accelerators were shown by Newer Technology (RAM disks, caches), Atto (a SCSI II accelerator for overworked printers and scanners), Rodime, and others.

Laser and Color Printers

It's clear from the show that the price for color and PostScript is now $9995 or less. QMS, Seiko (showing products with both A- and B-size output), Tektronix, Lasergraphics, General Parametrics, and CalComp all have such offerings. Seiko's product, at the lowest price, is reported to be backordered for several months. Kodak showed a 35mm-quality thermal printer for $25,000.

Prices have also tumbled for laser printers. Printers offering better speed

(continues)

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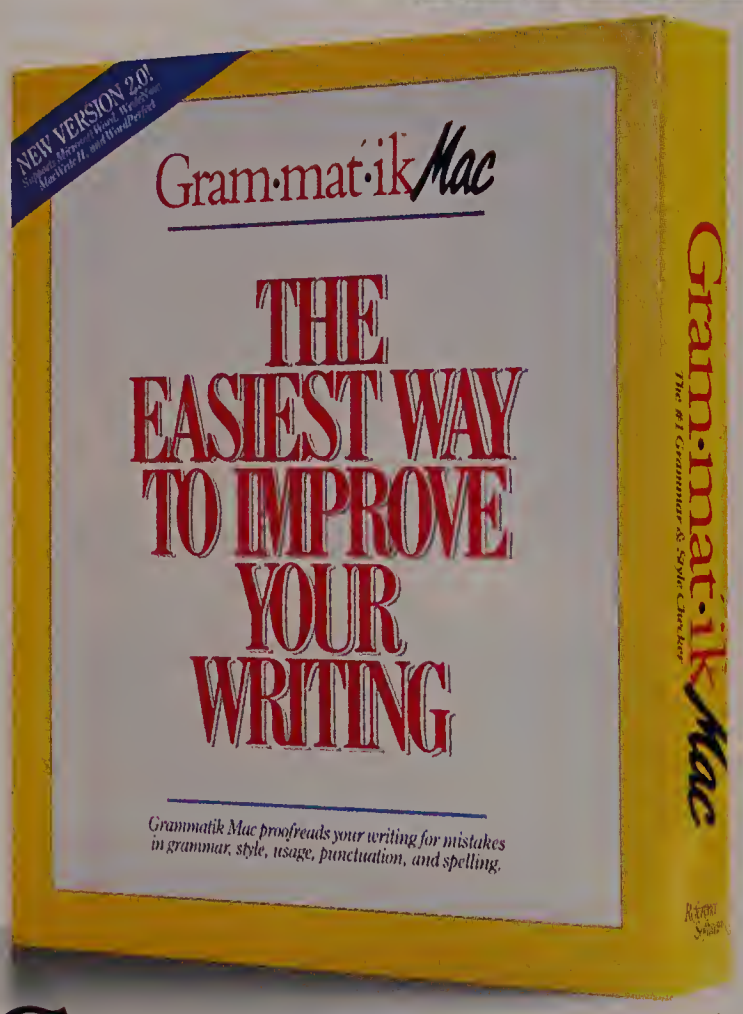

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Survival of the fittest.

Which color scanner is the natural selection?

Microtek Scan Original: 8 x 10 B&W print
Brightness level: default Input resolution: 150 dpi
File Size: 486K Output Resolution: 300 dpi
Line Screen: 133 lpi Gamma Correction: None

When it comes to selecting the right scanner, be forewarned. It's a jungle out there. You may not get the quality you were promised.

The La Cie Silverscanner has evolved beyond all that. Just look at this comparison between the Microtek 300ZS and the La Cie Silverscanner. Each image was scanned at default settings with no corrections. This **entire** ad was then created and separated using Adobe Photoshop, QuarkXPress 3.0 and a Linotronic 330.

As you can see, Silverscanner is a more advanced species of scanner which provides superior color, gray scale and line art over other similar scanners. La Cie gives you more with OCR compatability, fast color previews, versatile scanning controls, and up to 1200 dpi.

As a bonus, Adobe Photoshop Limited Edition, Aldus PrePrint and La Cie's exclusive plug-in scanning modules are included FREE with every Silverscanner purchase.

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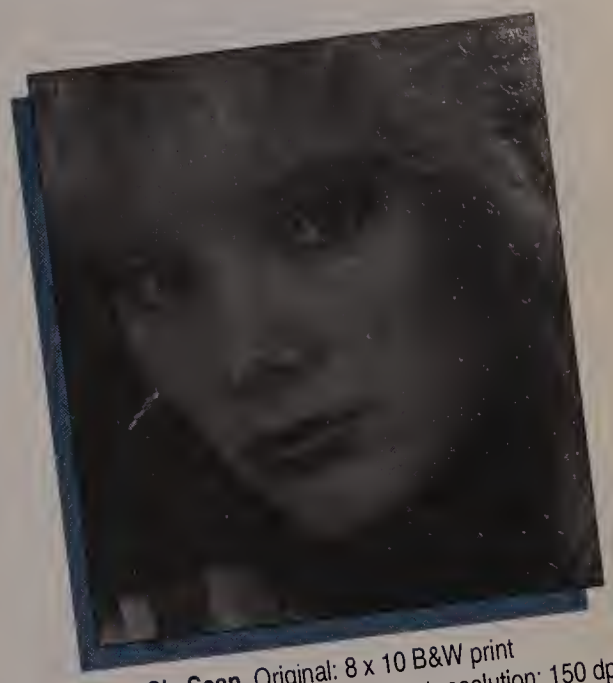

LaCie Scan Original: 8 x 10 B&W print
Brightness level: default Input resolution: 150 dpi
File Size: 484K Output Resolution: 300 dpi
Line Screen: 133 lpi Gamma Correction: None

Microtek Scan Original: 8 x 10 color print
Brightness level: default Input resolution: 150 dpi
File Size: 1,506K Output Resolution: 300 dpi
Line Screen: 160 lpi Color Correction: None

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LaCie Scan Original: 8 x 10 color print
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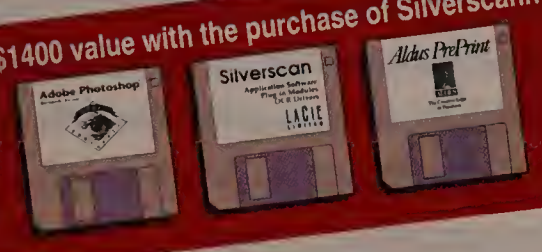

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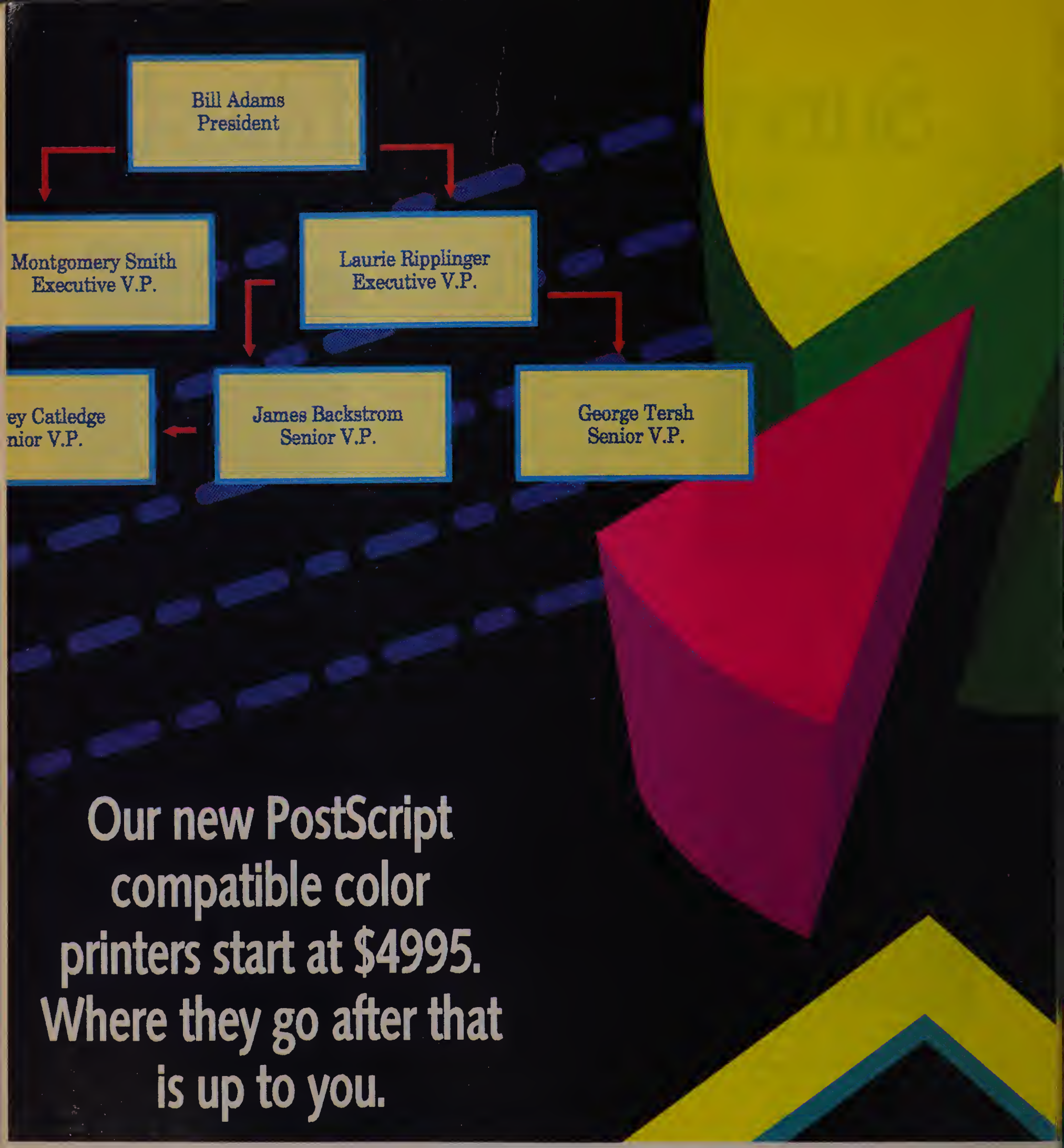

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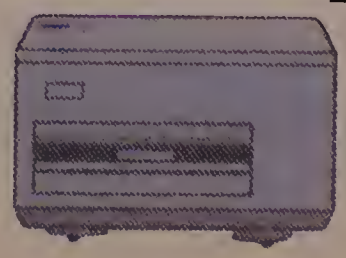

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and B-size output were announced by several companies, including LaserMax and QMS. Dataproducts has a new product in the wings.

Input of Color Images

Howtek and Kodak showed reworked models of their 35mm scanners, while Abaton, Umax, XRS, and Howtek had new color flatbed scanners. Nisca showed a small color scanner similar to the small Sharp scanner. Koala announced new technology for video-camera input via the SCSI port. Truvel has a new owner and a simplified product line.

Utilities

Capture from Mainstay is now in release 4.0 (saves TIFF files). MarkUp (also from Mainstay) with voice annotation is soon to ship. DiskExpress II, from AlSoft, is out. Aladdin Systems has brought out a new version of StuffIt Deluxe. Affinity Microsystems announced Tempo II+, and Central Point Software announced a new version of MacTools Deluxe.

CAD

Despite the somewhat disastrous experience of both Autodesk and VersaCAD Corporation in the Mac market (and their absence from the show), other companies continue to forge ahead. In architectural CAD, Graphisoft has taken a strong lead in the United States. There's a new version of Innovative Data Design's MacDraft. Schlumberger's MacBravo looks ever better. VIDI's Presenter Professional makes Pixar's MacRenderMan rendering routines easily usable—a boon to all of us who would like to make use of RenderMan's exquisite rendering techniques.

Virtus showed 3-D modeling software aimed at architectural markets. DesignCAD, GraphSoft, and Engineered Software presented new versions of their CAD products. ModaCAD was showing a stereo 3-D version of its product for garment fabrication and design.

3-D Design

Swivel 3-D Professional 2.0 has become the dominant 3-D product for the Mac. Byte by Byte's Sculpt 3D, a perennial favorite (and nonshipping product) of mine at trade shows, is finally shipping at the price of (groan) $2500. Levco has been sitting on a 3-D modeler written by Duane Maxwell for too long—there is a question as to whether that company will be able to publish the product. Specular International officially announced Infini-D, a 3-D modeler.

Paint, Draw, Illustration

PixelPaint Professional 2.0, the leader in the color paint market, has suffered in market share due to competition from Adobe Photoshop and has new competitors in Strata's StrataVision and Electronic Arts' Studio/32. PixelPaint 2.1 is now shipping and with a lower price. Time Arts' Oasis paint

(continues)

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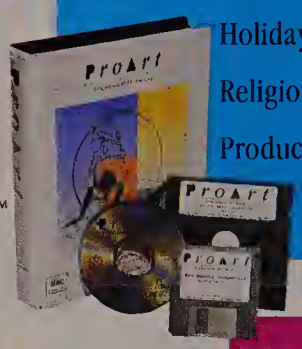

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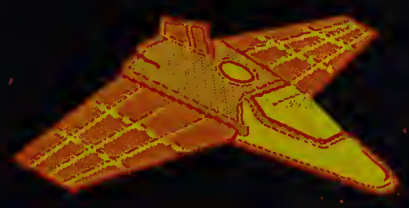

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program for the Mac was downplayed at the show but is apparently shipping.

Deneba's Canvas, which has taken over the realm of SuperPaint and MacDraw, was shown in version 3.0, a great improvement. Claris announced MacDraw Pro, with many new features, intended to retake its traditional market. MediaLab Technologies announced PictureAccess, which the company says competes effectively with Photoshop and has unique features, such as compression and communications functions.

Animation

FilmMaker, the French product at last brought to the U.S. market by Paracomp, is the leader on the Macintosh. Two other animation entries were at the show: Motion Works' AddMotion for HyperCard users, and Gold Disk's Animation Works, a more powerful general-purpose animation package.

Image Compression

There is a race between several vendors for image-compression products. Storm Technology has a software-hardware combination that leads the available solutions. But if Radius succeeds with its ImpressIt software-only product, Storm may suffer the usual slings of a pioneer. Pinnacle Micro was also showing a hardware compression/decompression board, but no software interface. Kodak showed Colorsqueeze, another software image-compression product.

One of the greatest problems we have is how to access the various types of graphics files. Computer Friends and Radius both have software that works with their hardware systems that present viewers of various file formats with thumbnail-size representations of files, software that should be rewritten as stand-alone applications. Alternatively, Adobe should write this ability into the next version of Photoshop. Symmetry demonstrated Mariah, a picture database with a similar capability, off the show floor.

Games

My picks of the show include Vette (driving at high speed through 3-D representations of the streets of San Francisco) from Spectrum HoloByte; *(continues)*

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You would be surprised at the number of people who have confided with me the fact that they've literally given up ever learning some of the programs. They simply put the box on the shelf and wrote the expenditure off as a bad investment.

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Can you imagine how much money has been wasted on programs and computers that are sitting abandoned? Right now think of the people working on Macs in your office. Do they really understand the machine? Do they know what to do when it goes down? How many programs are each of your people using? Have they really mastered the programs they're using? Do they know the short-cuts and valuable techniques that will save you time, money, and increase your professionalism?

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Calls	01/29/85	100	$4.38	$230.00	$43,980.00	02/11/85	$5.63	$267.50	$55,982.50	$12,002.50
Puts	03/12/85	100	$2.88	$209.25	$28,959.25	03/19/85	$4.00	$218.75	$39,781.25	$10,822.00
Calls	04/26/85	100	$3.50	$209.25	$35,209.25	05/20/85	$6.75	$301.25	$67,198.75	$31,989.50
Calls	06/26/85	100	$2.38	$209.25	$23,959.25	07/01/85	$3.13	$249.25	$31,040.75	$7,081.50
Calls	07/18/85	100	$5.00	$248.75	$50,248.75	07/23/85	$3.75	$411.25	$37,288.75	($12,960.00)
Puts	08/13/85	100	$3.25	$209.25	$32,709.25	08/26/85	$2.75	$209.25	$27,290.75	($5,418.50)
Puts	09/16/85	100	$2.25	$209.25	$22,709.25	09/26/85	$2.50	$209.25	$24,790.75	$2,081.50
Calls	11/05/85	100	$4.88	$245.00	$48,995.00	12/18/85	$15.63	$687.50	$195,562.50	$146,567.50
Calls	01/27/86	100	$3.25	$209.25	$32,709.25	03/01/86	$5.38	$425.00	$108,325.00	$75,615.75
Calls	03/12/86	100	$4.75	$241.25	$47,741.25	04/29/86	$8.25	$387.50	$95,862.50	$48,121.25
Calls	05/21/86	100	$4.50	$233.75	$45,233.75	06/[illegible]/86	$3.75	$391.25	$97,108.75	$51,875.00
Calls	08/06/86	100	$4.13	$222.50	$41,472.50	08/[illegible]/86	$12.75	$481.25	$127,018.75	$85,546.25
Calls	09/17/86	100	$4.50	$233.75	$45,233.75	09/[illegible]/86	$6.88	$305.00	$68,445.00	$23,211.25
Calls	11/25/86	100	$4.13	$222.50	$41,472.50	11/19/86	$4.88	$245.00	$48,505.00	$7,032.50
Puts	01/02/87	100	$2.38	$209.25	$23,959.25	01/05/87	$1.00	$209.25	$9,790.75	($14,168.50)
Calls	01/08/87	100	$6.75	$301.25	$67,801.25	03/[illegible]/87	$7.63	$987.50	$295,262.50	$227,461.25
Calls	03/05/87	100	$3.50	$209.25	$35,209.25	03/[illegible]/87	$2.94	$209.25	$29,165.75	($6,043.50)
Calls	03/20/87	100	$4.75	$241.25	$47,741.25	04/[illegible]/87	$8.25	$346.25	$82,153.75	$34,412.50
Calls	05/06/87	100	$3.75	$211.25	$37,711.25	06/[illegible]/87	$2.63	$209.25	$22,290.75	($15,420.50)
Puts	05/19/87	100	$4.88	$245.00	$48,995.00	06/21/87	$1.63	$323.75	$74,676.25	$25,681.25
Calls	06/17/87	100	$4.25	$226.25	$42,726.25	07/16/87	$8.25	$346.25	$82,153.75	$39,427.50
Calls	07/31/87	100	$3.13	$[illegible]	$31,[illegible]	08/[illegible]/87	$2.50	$249.25	$49,751.25	$18,292.00
Calls	08/10/87	100	$5.88	$278.00	$55,[illegible]	08/26/87	$3.69	$[illegible]	$136,390.55	$77,365.55
Puts	09/09/87	100	$2.38	$230.00	$23,980.00	09/[illegible]/87	$3.63	$[illegible]	$36,040.75	($7,939.25)
Puts	10/08/87	100	$3.00	$[illegible]	$47,803.13	10/[illegible]/87	$97.00	$[illegible]	$967,242.50	$889,439.37
Puts	11/10/87	100	$3.38	$[illegible]	$50,2[illegible]	11/[illegible]/87	$[illegible]	$[illegible]	$269.38	$56,605.63	$6,356.88
Calls	11/13/87	100	$3.50	$[illegible]	$3[illegible]	11/24/87	$2.25	$209.25	$23,540.75	($11,663.00)
Calls	10/18/88	100	$2.13	$[illegible]	$[illegible]	12/[illegible]/88	$[illegible]	$[illegible]	$[illegible]	$51,107.88
Calls	02/11/88	100	$2.25	$[illegible]	$[illegible]	03/[illegible]	$3.63	$[illegible]	$75,922.50	$53,213.25
Puts	03/25/88	100	$3.38	$209.25	$[illegible]	04/[illegible]	$5.63	$[illegible]	$55,982.50	$22,023.25
Calls	05/16/88	100	$4.63	$237.50	$[illegible],487.5[illegible]	05/[illegible]	$5.25	$[illegible].25	$52,243.75	$5,756.25
Calls	05/26/88	100	$4.25	$226.25	$[illegible]42,7[illegible]	06/27/88	$15.00	$548.75	$149,451.25	$106,725.00
Calls	08/01/88	100	$4.00	$218.75	$40,2[illegible]	08/05/88	$[illegible]	$20[illegible]	$26,040.75	($14,178.00)
Puts	08/10/88	100	$4.00	$218.75	$40,[illegible]8.75	08/24/8[illegible]	[illegible]38	$32[illegible]	$73,430.00	$33,211.25
Puts	10/[illegible]	100	$[illegible]	$[illegible]	$[illegible]	10/[illegible]	$[illegible]	$[illegible]	$[illegible]	($[illegible]18.50)
Calls	10/18/88	100	$5.50	$263.75	$[illegible]63.75	11/21/88	$[illegible]9.50	$[illegible]3.75	$94,616.25	$39,352.50
Calls	01/09/89	100	$7.13	$312.50	$[illegible],562.5[illegible]	02/[illegible]/89	$[illegible]18.00	$[illegible]6.75	$179,361.25	$107,798.75
Calls	02/17/89	100	$6.25	$286.25	$[illegible]62,7[illegible]	02/[illegible]/89	$[illegible]	$[illegible]6.25	$52,243.75	($10,542.50)
Puts	02/23/89	100	$3.75	$211.25	$37,7[illegible]	03/02/[illegible]	$[illegible]	$245.00	$48,505.00	$10,793.75
Calls	03/06/89	100	$5.63	$267.50	$5[illegible]51	03/17/[illegible]	$[illegible]	$350.00	$83,400.00	$26,882.50
Calls	03/29/89	100	$6.38	$290.00	$64,[illegible]0.00	05/[illegible]	$[illegible].75	$421.25	$107,078.75	$43,038.75
Puts	05/10/89	100	$2.63	$209.25	$26,[illegible]9.25	[illegible]/[illegible]	[illegible]1.75	$209.25	$17,290.75	($9,168.50)
Calls	07/06/89	100	$5.75	$271.25	$57,771.25	07/[illegible]/89	$25.00	$673.25	$249,326.75	$191,555.50
Calls	08/24/89	100	$3.63	$209.25	$36,459.25	08/25/89	$8.13	$342.50	$80,907.50	$44,448.25
Calls	09/28/89	100	$4.13	$222.50	$41,472.50	10/09/89	$11.25	$436.25	$112,063.75	$70,591.25
Calls	12/29/89	100	$4.13	$222.50	$41,472.50	01/03/90	$8.25	$346.25	$82,153.75	$40,681.25
Puts	01/09/90	100	$5.50	$263.75	$55,263.75	01/15/90	$13.00	$488.75	$129,511.25	$74,247.50
Puts	01/16/90	100	$8.75	$361.25	$87,861.25	01/24/90	$14.88	$545.00	$148,205.00	$60,343.75
Puts	02/21/90	100	$4.25	$226.25	$42,726.25	02/26/90	$2.94	$186.88	$29,188.13	($13,538.13)
Calls	03/16/90	100	$6.63	$297.50	$66,547.50	03/20/90	$10.00	$398.75	$99,601.25	$33,053.75
Calls	04/12/90	100	$5.50	$263.75	$55,263.75	04/16/90	$8.25	$346.25	$82,153.75	$26,890.00
Puts	04/19/90	100	$5.38	$[illegible]3.75	$[illegible]9,[illegible]3.75	04/27/90	$1.38	$[illegible]3.75	$[illegible]1.25	$[illegible]9,352.50
Calls	05/08/90	100	$4.75	$241.25	$47,741.25	05/14/90	$19.25	$676.25	$191,823.75	$144,082.50
Calls	06/22/90	100	$6.63	$297.50	$66,547.50	06/25/90	$3.63	$207.50	$36,042.50	($30,505.00)
Puts	08/07/90	100	$7.88	$335.00	$79,085.00	08/24/90	$22.25	$766.25	$221,733.75	$142,648.75
Calls	01/17/91	100	$12.88	$485.00	$129,235.00	01/18/91	$19.00	$668.75	$189,331.25	$60,096.25
										$3,107,956.92

76.79% Accurate: Above is a chart of OEX trades from December 28, 1984 to January 18, 1991, based on the signals generated by the ***Right Time-Index Program***™*. By following the signals generated by the program, the rules in the manual and starting with just a small amount of capital ($30,209.25) your profits would have been over $3,100,000.00.*

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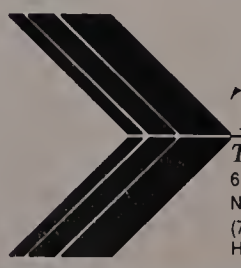

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All programs not available for all computers

Circle 25 on reader service card.

Riddler from Threshold Publishing for the toddler with a yen to compute; Tesserae from Inline Design for those addicted to geometric puzzles on the Mac; and SpaceShip Warlock, a CD game from Mike Saenz. (Just buy this disk, will you? Let's all support Mike so that he can develop the masterpiece that is simmering away in his active imagination.) Also a new CD ROM version of Cosmic Osmo, with about 100MB of new stuff and planets from Mediagenic. PC Globe, a PC software company, was showing early versions of mapping and educational games for the Mac that have great promise.

CD Authoring

Meridian Data announced a Mac-based CD ROM mastering system for about $30,000, while Authorware has a new version of its authoring software in the works. Highlighted Data, producer of several works on CD ROM, is shipping a new CD ROM disc called Who Owns What, a guide to ownership of rights to movies and video for the current century. As far as laser discs go, The Voyager Company, Robert Stein's hobby and working concern, launched four new discs: on Eadweard Muybridge, Igor Stravinsky (CD ROM only), Michelangelo, and the Louvre.

Desktop Publishing

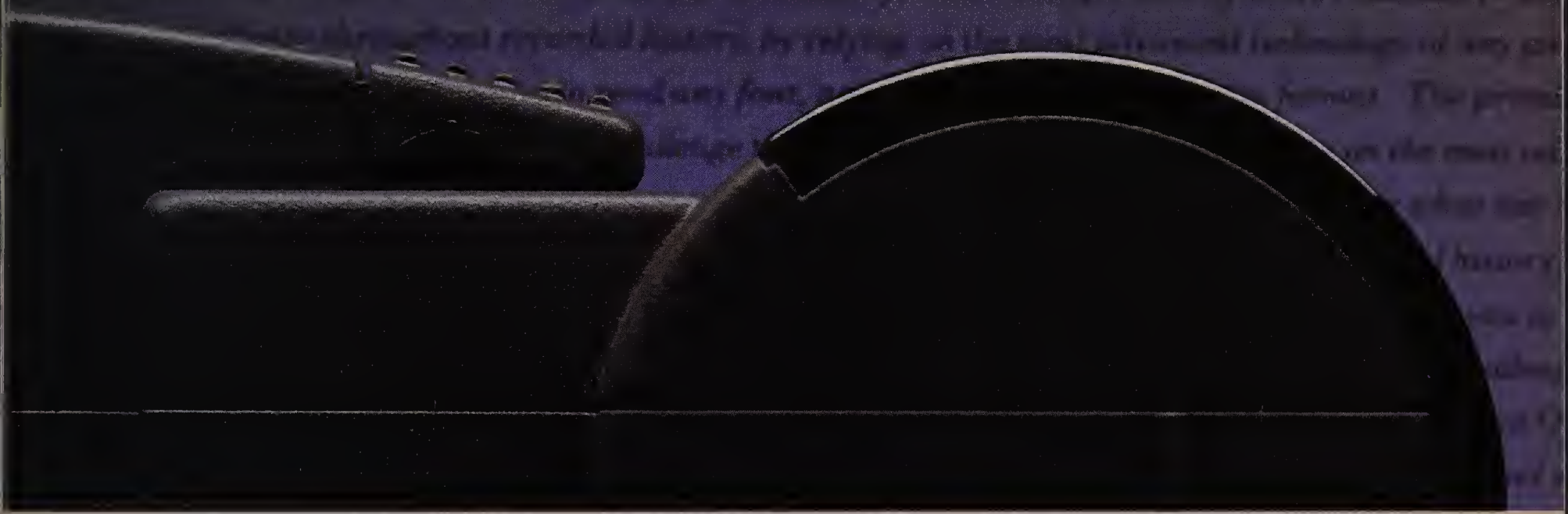
Aldus has finally published Silicon Beach's Personal Press software. Timeworks has a new version of Publish It called Publish It Easy, which competes with Personal Press and has a richer feature set at a lower price.

Aldus has recognized the speed problems of PageMaker 4.0 and is preparing a faster version. Ventura Publisher Macintosh Edition is at long last shipping, and Frame Technology told me about an update to FrameMaker 2.0 for the Mac.

QuarkXPress, the spoiler for Aldus, has increased its competitive drive and is actively taking PageMaker market share. Letraset, jammed into a tiny booth, drew crowds of faithful users to see its Studio line of products, with ColorStudio the most successful. The company has reorganized yet again and announced its firm intent to support the Macintosh. An-

(continues)

The Ultimate Typist



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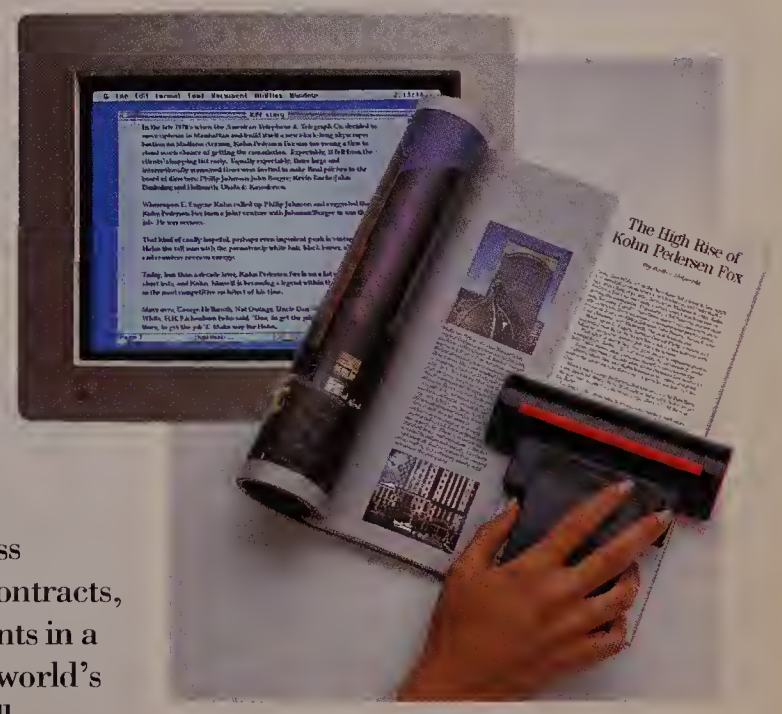

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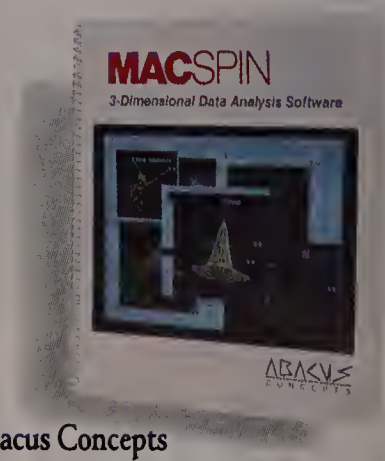

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6123 Virtual 2.04 *(for SE/30, IIcx, IIx, & IIci)* 115.
6122 Virtual 2.02 *(for Mac II, incl. PMMU)* 188.
6647 HandOff II 1.1.3 . . . . . 57.
Eddy H.M. - Best Utility

★Dantz Development ... 30 day MBG
5255 Retrospect 1.2 . . . . . $148.
7945 Retrospect Remote 1.2. . . . . 265.
Eddy H.M. - Best Connectivity Software
7946 Remote *(10 Pack of inits)* . . . . . 148.
★Design Science ... 30 day MBG
7887 MathType 2.0 . . . . . 89.
★Digitalk ... 60 day MBG
5166 SmallTalk/V Mac 1.1 . . . . . 124.
Dubl-Click Software
7974 ClickChange 1.04. . . . . 41.
1824 Calculator Construction Set 2.09.6 . 45.
★Fifth Generation ... 30 day MBG
4287 PYRO! 4.0 . . . . . 25.
3955 Suitcase II 1.2.6 . . . . . 49.
FastBack II 2.5 or DiskLock 2.0 . . . 118.
8284 SuperSpool 5.0 . . . . . 62.
8286 SuperLaserSpool 2.02 . . . . . 93.
ICOM Simulations
4084 On Cue 1.3. . . . . 35.
4085 TMON 2.8.4 . . . . . 86.

Penton Overseas ... 30 day MBG
VocabuLearn/ce–Building blocks of language. New version features: type answers, user modifiable options, create personal data stacks, keep statistics, and more. 3 hours of sound. Includes free HyperCard 2.0 . . **see line listing.**

★Insight Development ... 30 day MBG
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★JAM Software ... 30 day MBG
6089 Smart Alarms 3.0 w/Appt. Diary 3.1 63.
6088 Smart Alarms 3.0 *(1-4 users)*. . . . . 125.
★Kent Marsh Ltd. ... 30 day MBG
5457 QuickLock 2.0 . . . . . 34.
2591 The NightWatch 1.03 . . . . . 85.
6134 MacSafe II. . . . . 107.
★Kiwi Software ... 60 day MBG
6267 KiwiEnvelopes! 3.1 . . . . . 33.
★Loop Software ... 30 day MBG
5442 PictureBook 3.2 . . . . . 39.
★Magic Software ... 30 day MBG
7267 AutoSave II 2.0 . . . . . 27.
7270 Backmatic 2.0 . . . . . 50.
★Microcom ... 30 day MBG
8562 Complete Undelete. . . . . 48.
4803 Virex 3.0 . . . . . 57.
8561 911 Utilities . . . . . 89.

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6089 *Smart Alarms 3.0 with Appointment Diary 3.1*–A Macintosh reminder and calendar system featuring: auto backup, variable snooze, multiple reminders, weekly and monthly views, and zoom. Multiple users available. . . . . $63.

★Microseeds Pub. ... 60 day MBG
7068 INITPicker 2.0. . . . . 35.
Redux 1.63 or Rival 1.1.4. . . . . *ea.* 49.
★Microsoft ... 30 day MBG
4471 QuickBasic 1.0 . . . . . 64.
★Millenium Software ... 30 day MBG
6105 HyperX 4.0. . . . . 99.
Multi-Ad Services
8850 Multi-Ad Search 1.0. . . . . 129.
★Now Software ... 30 day MBG
6925 Now Utilities 2.0 . . . . . 75.
6739 Prototyper 3.0. . . . . 184.
Olduvai
4503 MultiClip 2.0 . . . . . 72.
★ON Technology ... 1 year MBG
6385 On Location 1.02 . . . . . 75.
★Palomar Software ... 30 day MBG
8210 Plottergeist 1.1 . . . . . 199.

ASD Software ... 30 day MBG
7085 *FileGuard Extended 2.5.2*–Protect your hard drives, applications, files/folders (including system folder) from unauthorized access, deletion, and/or illegal copying. Now with system usage audit trail. 5 & 10 user also available. . . . $139.

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★**Solutions, Inc. ... 60 day MBG**
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3449 SuperGlue II 2.01 . . . . . 75.
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5176 Symantec AntiVirus for Mac *(SAM)* . 65.
5724 Symantec Utilities for Mac *(SUM II)* . 96.
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3421 THINK Pascal 3.0 . . . . . 165.
Eddy - Best Development Tool
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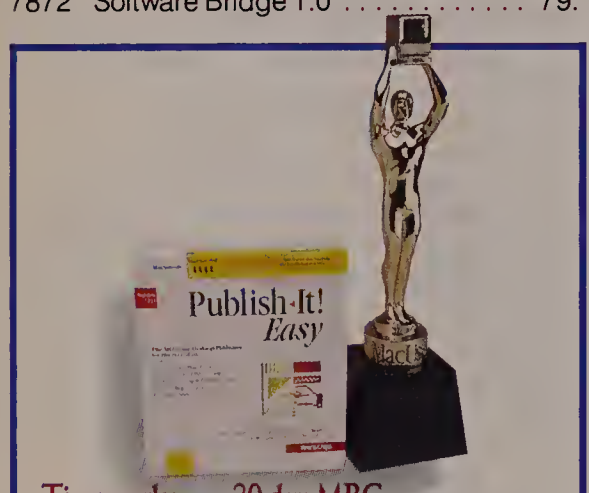
★**Synex ... 30 day MBG**
7147 MacEnvelope 5.02 . . . . . 57.
★**Systems Compatibility ... 30 day MBG**
7872 Software Bridge 1.0 . . . . . 79.



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7115 *Publish It! Easy 2.0*–1990 MacUser Editors' Choice Award for *Best Page Design Program*. "Its combination of word processing, graphics, and page-layout capabilities work speedily on any Mac." . . . . . **$145.**

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★**TGS Systems ... 60 day MBG**
6667 Prograph 2.0 Compiler Version. . . 245.
★**Williams & Macias ... 30 day MBG**
3781 LaserWriter Label Pack *(Qty. 216)* . . 18.
6926 myDiskLabeler III 3.0 . . . . . 42.
4976 StickyBusiness 1.4 . . . . . 51.
Wolfram Research
8273 Mathematica Enhanced 1.2 . . . . . 699.
★**Zedcor ... 60 day MBG**
3985 ZBasic 5.0 . . . . . 99.

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8125 Cosmic Osmo *(CD-ROM)* . . . . . 46.
Eddy - Best Recreation Program
CD Technology
8057 CD-ROM Porta Drive . . . . . 649.
7626 Porta Drive & MS Office CD-ROM . 999.
Chinon
8813 CDA-431 CD-ROM Drive. . . . . 639.

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8965 *Pixar Showplace 1.0*–Complete picture-making tool. Alter conditions to achieve any scene you wish. Automatically processes your scene into a full-color picture. Imports into other presentation/desktop publishing applications . . . **$469.**

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7712 MacroMind CD-ROM . . . . . 125.
★**Microsoft ... 30 day MBG**
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ProArt Trilogy *(CD-ROM series)* ea. 259.
NEC
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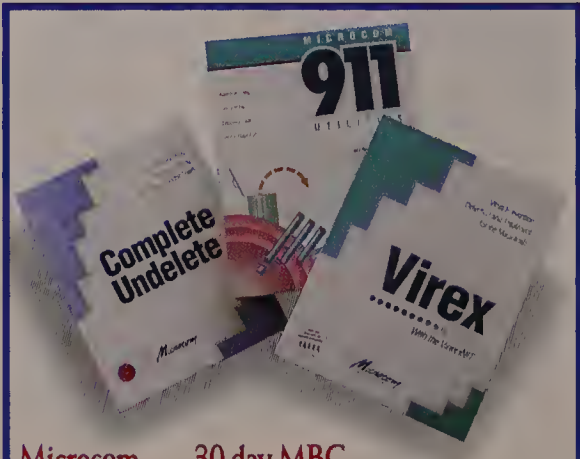
6744 CDR35 CD-ROM Portable Drive . . 349.
6743 Mac Driver Kit. . . . . 64.
Passport Designs
8255 Desktop Music Creativity *(CD-ROM)* 189.
8607 Music Production Kit *(CD-ROM)* . 1259.
★**Somak Software ... 30 day MBG**
LaserArt CD-ROM Vol. 1 or 2 . . ea. 62.
Toshiba
6749 XM 3201 CD-ROM Drive. . . . . 779.



Microcom ... 30 day MBG
4803 *Virex 3.0*–Comprehensive solution to the threat of computer viruses . . . . . **$56.**
8561 *911 Utilities*–Troubleshooting, file/disk recovery, complete undelete, isolate bad sectors, & Virex. **89.**
8562 *Complete Undelete*–Recovers deleted files **48.**

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8217 Ishido: The Way of the Stones . . . . . 32.
8220 Jack Nicklaus Greatest 18. . . . . 34.
Activision
4486 Manhole. . . . . 28.
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7785 Talking Moose . . . . . 23.
★**Beacon Technology ... 30 day MBG**
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6135 Super Studio Session w/Music Library 99.
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8056 *Studio/32 1.0*–1990 MacUser Editors' Choice Award for *Best Graphics Program*. The professional's tool for all aspects of design. **$449.**
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6516 The Playroom 1.1 *(CP)* . . . . . 29.
Eddy H.M. - Best Recreation Program
Carmen Sandiego Series *(CP)* . .ea. 29.
8266 SimEarth 1.0. . . . . 40.
4966 SimCity 1.2 *(CP)* . . . . . 29.
5871 SimCity Supreme 1.2C . . . . . 47.
Geom., Physics, or Calc. *(CP)* . ea. 58.
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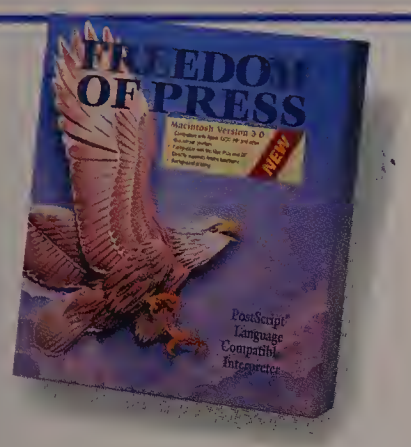
4074 P51 Mustang *(CP)*. . . . . 36.
Carina Software
5726 Voyager 1.2 . . . . . 88.
★**Casady & Greene ... 60 day MBG**
2268 Crystal Quest 2.2 . . . . . 29.
Mission Starlight or Sky Shadow ea. 29.
Centron Software
8525 Casino Master *(B&W)* . . . . . 41.
8524 Casino Master *(Color)*. . . . . 45.
Coda Music Systems
8188 MusicProse 2.0. . . . . 299.
5604 Finale 2.5 . . . . . 549.
Davidson & Associates
1734 Math Blaster! 1.0 *(CP)*. . . . . 29.
6128 Math Blaster Mystery *(CP)*. . . . . 29.
8278 Alge-Blaster Plus . . . . . 35.

against all the rest



Custom Applications ... 30 day MBG
6517 *Freedom of Press 3.0*–Brings PostScript printing capabilities to non-PostScript, black and white devices. New features include Adobe Type 1 support and compatibility with all Macs . $255.
8037 *Freedom of Press Light 3.0* (17 fonts) . . . . 56.

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8050 EARTHQUEST 1.0 . . . . . 48.

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6716 Pipe Dreams 1.0 . . . . . 17.
8643 Harpoon . . . . . 39.

★Great Wave ... 30 day MBG
KidsTime, Amer. Discov., KidsMath ea. 26.
4334 NumberMaze *(B&W)* 26. 8527 *(Color)* 36.
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8043 *(B&W)* . . . . 26. 8044 *(Color)* . . . . 36.

★HyperGlot Software ... 30 day MBG
Word Torture - Beginner to Advanced
(Span., Fren., Germ., Ital. & Rus.) ea. 29.
Pronunciation Tutor - Beginner
(Span., Fren.) . . ea. 35. *(Germ.)* . . 39.
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(Spanish, French, German) . . . ea. 39.
6611 Kanjimaster - Beg. *(Japanese)* . . . . 99.

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8581 *DataClub 1.1 (3 user)–Honorable Mention–* 1990 MacUser Editors' Choice Award for *Best Work-Group Product.* Parallel processing performance, centralized server access, & practically unlimited storage–needs no dedicated hardware . . $199.

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7622 Darwin's Dilemma 1.0 . . . . . 32.
8809 Tesserae 1.0 . . . . . 32.

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2670 Reader Rabbit 2.2 *(CP) (ages 4-7)* . . 30.
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★Leister Productions ... 30 day MBG
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★Microsoft ... 30 day MBG
2868 Flight Simulator 1.02 *(CP)* . . . . . 32.

★Mysterium Tremendum ... 30 day MBG
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★Nordic Software ... 30 day MBG
8258 Turbo Math Facts 1.1 . . . . . 26.
8260 Word Quest 1.0 . . . . . 31.
8257 PreSchool Pack 1.0 . . . . . 36.

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8253 TRAX 2.0 . . . . . 59.
8254 Desktop Music Creativity Kit . . . . . 189.
3117 Master Tracks PRO 4 4.1.4 . . . . . 319.
8250 Encore 1.3.1 . . . . . 379.
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8880 Alchemy . . . . . 439.
3115 MIDI Interface . . . . . 85.

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6466 Citadel . . . . . 26.

Premier Technology
Strategic Conquest or NetTrek . ea. 34.

Sierra On-Line
3397 Leisure Suit Larry *(CP)* . . . . . 23.

Sir-Tech Software
8228 Wizardry II *(CP)* . . . . . 29.

★Software Toolworks ... 30 day MBG
4619 Mavis Beacon Typing 1.3 *(CP)* . . . . 32.
4588 Life & Death *(CP)* . . . . . 32.

★Spectrum Holobyte ... 30 day MBG
3464 Tetris 1.1 . . . . . 22.
6112 Welltris 1.1 . . . . . 22.
Eddy H.M. - Best Recreation Program
8180 Faces . . . . . 24.
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8084 Halls of Montezuma . . . . . 26.
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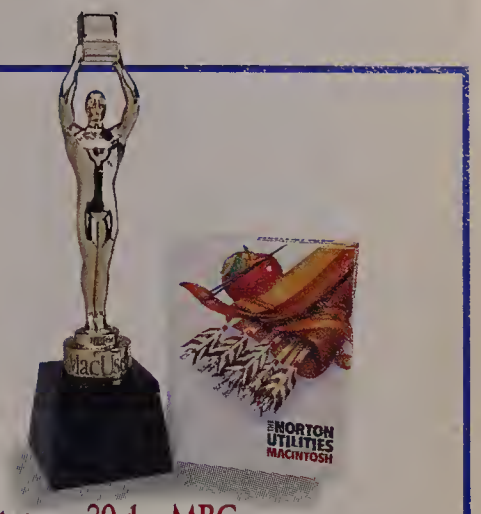
ACT, GMAT, GRE, or SAT Prep . ea. 29.
8098 LSAT Prep for the Mac . . . . . 35.

★Terrace Software ... 30 day MBG
8192 Mum's The Word *(gardening)* . . . . . 79.



Symantec ... 30 day MBG
6748 *Norton Utilities for the Mac 1.0*–1990 MacUser Editors' Choice Award for *Best Utility.* "Has redefined the state of the art of data-recovery software. An excellent collection of tools that speed up disk-related work." . . . $84.

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6040 MacGolf Classic *(CP)* . . . . . 52.

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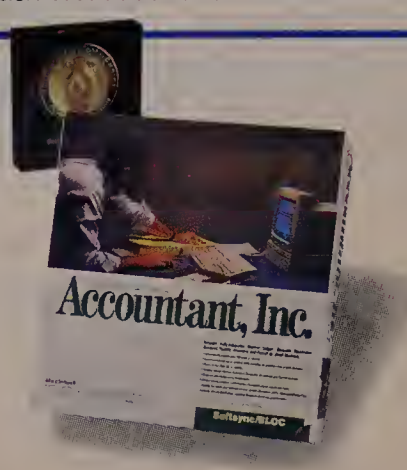
★Abaton ... 30 day MBG
6266 InterFax 24/96 Modem . . . . . 349.

Applied Engineering
8365 DataLink Express . . . . . 175.
DataLink/Mac or Mac Portable ea. 209.
8938 DataLink LC . . . . . 265.
8362 QuadraLink . . . . . 209.

★Beagle Bros. ... 30 day MBG
7691 Flash 1.1 . . . . . 127.



Softsync/BLOC ... 30 day MBG
7129 *Accountant, Inc. 2.0–Honorable Mention–* 1990 MacUser Editors' Choice Award for *Best Financial Management Pkg.* Integrates General Ledger, Payables, Receivables, Payroll, Inventory and Project Management. . . . $345.

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★CE Software ... 60 day MBG
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★CompuServe ... 60 day MBG
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1673 CompuServe Navigator 3.0 . . . . . 49.
1674 Membership Kit/Navigator Bundle . 69.
★DataViz ... 60 day MBG
1823 MacLink Plus/PC 5.0. . . . . 117.
4842 MacLink Plus/Translators 5.0 . . . . . 98.
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8719 EtherPrint . . . . . 349.
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8720 DaynaTALK *(5 Pak)*. . . . . 389.
8721 DaynaTALK *(10 Pak)*. . . . . 695.
★Dove Computer ... 60 day MBG
6758 DoveFax Desktop 1.1.1 . . . . . 299.
★Dow Jones ... 30 day MBG
5295 News/Retrieval Membership Package 24.
EveryWare
8077 AllShare 1.0 . . . . . 139.
★Farallon Computing ... 30 day MBG
5707 Timbuktu 3.1 . . . . . 95.
Eddy - Best Connectivity Software
4867 Timbuktu 3.1 30-Pack. . . . . 1285.
4866 Timbuktu/Remote 2.0 . . . . . 123.
6371 Timbuktu/Remote Access Pack . . 845.
8707 Liaison 3.0 . . . . . 259.
6273 PhoneNET StarConnector 10-Pack. 129.
4869 PhoneNET Connector 10-Pk *(DIN-8)* 198.
2206 PhoneNET StarController 300 . . . . 825.
6687 PhoneNET StarController-EN. . . . 1589.
6766 MediaTracks . . . . . 189.
Eddy H.M. - Best Multimedia Software
6768 MediaTracks Multimedia Pack. . . . 319.
★Freesoft ... 60 day MBG
6115 White Knight 11. . . . . 85.
★Global Village ... 30 day MBG
8946 TelePort A300 . . . . . 129.
Eddy - Best Communications Product
8945 TelePort/FAX . . . . . 185.
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2300 Smartcom II 3.2 . . . . . 84.
2307 Smartmodem 2400. . . . . 349.
5991 V9600 Baud Modem . . . . . 689.
Insignia Solutions
7557 Access PC 1.0 . . . . . 62.
7058 SoftPC-AT/EGA Module . . . . . 125.
4089 SoftPC 1.3 . . . . . 245.

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5119 2400EX Modem . . . . . $179.
6420 2400EX MNP Modem. . . . . 229.
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5631 Rapport 1.3.4 . . . . . 195.
7588 Drive 360 *(5¼")* . . . . . 249.
7590 Drive 1200 *(5¼")* . . . . . 249.
5632 Drive 2.4 *(3½") (incl. FastBack II)* . 325.
★Microcom ... 30 day MBG
7465 CarbonCopy Mac *(Twin Pack)*. . . . 169.
8027 MacModem V.32 . . . . . 689.
★Nuvotech ... 60 day MBG
3000 TurboNet ST *(DIN-8)* . . . . . 30.
6751 TurboNet ST *(12-Pack)*. . . . . 279.
6272 NuvoLink SC . . . . . 389.
★Orchid Technology ... 30 day MBG
6949 OrchidFAX Modem 1.06. . . . . 429.
★Practical Peripherals ... 30 day MBG
3102 2400 Baud External Modem . . . . . 179.
5285 PM2400SA MNP Modem . . . . . 209.
7934 PM9600SA Modem 1.26 . . . . . 489.
3089 Mac Communications Pack 1.5 . . 225.

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5707 *Timbuktu 3.1*–1990 MacUser Editors' Choice Award for *Best Connectivity Software*. Allows a Mac to view and control other Macs on a network simultaneously. A great brainstorming tool. . . . . $95.

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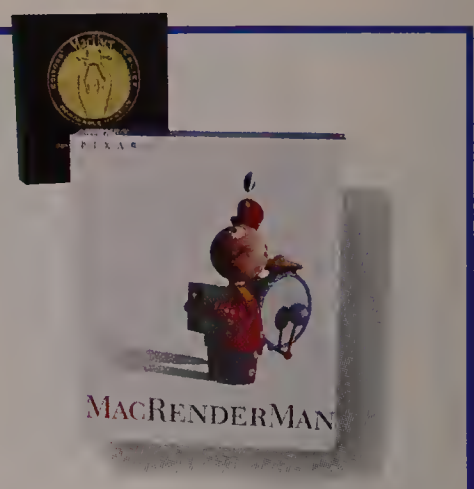
★Prometheus ... 30 day MBG
8762 Travel Modem . . . . . 195.
8350 2400 Mini for Mac. . . . . 149.
8348 24/96 Minifax . . . . . 199.
8349 Maxfax. . . . . 295.
8709 2400M Plus. . . . . 219.
8738 9600M Plus . . . . . 599.
Eddy H.M. - Best Communications Prod.
★Shiva ... 30 day MBG
3444 NetSerial 3.3. . . . . 275.
4347 NetBridge. . . . . 409.
4942 TeleBridge . . . . . 409.
3443 NetModem V2400 3.3 . . . . . 339.
6917 NetModem V.32 *(V.42 & V.42 bis)*. 1169.
Eddy H.M. - Best Connectivity Hardware
6519 EtherGate . . . . . 1619.
8189 FastPath IV . . . . . 1889.
★Sitka/TOPS ... 30 day MBG
4188 TOPS Teleconnector *(DIN8)* . . . . . 23.
3720 TOPS Flashcard . . . . . 155.
6264 TOPS Networking Bundle 3.0 . . . . 187.



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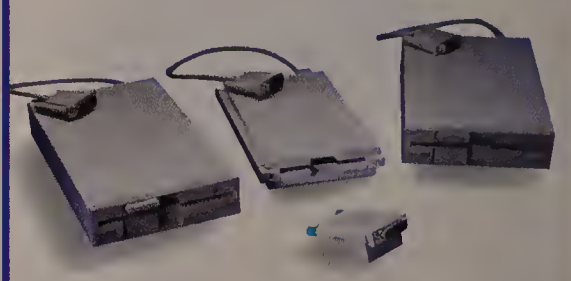
8966 *MacRenderMan–Honorable Mention*–1990 MacUser Editors' Choice Award for *Best 3D Modeling/Rendering Pkg.* Combine with any 3D program to create photographic-quality images with the most advanced rendering software $549.

★Software Ventures ... 30 day MBG
3455 MicroPhone II 3.0 . . . . . 215.
★Solutions, Inc. ... 60 day MBG
6720 FAXGATE Plus 1.1.2. . . . . 239.
★Synergy ... 30 day MBG
6618 VersaTerm 4.5. . . . . 88.
6619 VersaTerm-PRO 3.5. . . . . 174.
★Traveling Software ... 60 day MBG
3729 LapLink Mac III Connectivity Pac . . 93.

INPUT/OUTPUT

★Abaton ... 30 day MBG
7432 Scan 300/GS *(reqs. Scan Kit)* . . . . 999.
Includes free ProPoint ($79 value).
American Power
5895 UPS 110SE. . . . . 209.
6686 UPS 370ci . . . . . 329.
Caere
8124 Typist . . . . . 479.
4476 OmniPage 2.1 . . . . . 495.
OmniSpell 1.0 or OmniDraft 1.0 ea. 69.
Chinon
8814 DS-3000 Scanner w/Dig. Darkroom 699.
8815 DS-3000 Scanner w/OmniPage . . 1099.



Kennect Technology ... 30 day MBG
Drives–Owners of any Macintosh (512e-IIci) can get complete compatibility with all IBM and Apple formats by plugging one or more of Kennect's 3½" or 5¼" drives into Rapport. . . . . **see line listing for prices.**

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★**CoStar ... 30 day MBG**
6090 LabelWriter . . . . . 185.
★**Datadesk ... 30 day MBG**
6901 Switchboard *(modular keyboard)* . 159.
Eddy H.M. - Best Input Device
MAC-101 Keyboards . . . . . *ea.* 129.
★**DayStar Digital ... 30 day MBG**
8556 FastCache for Mac IIci . . . . . 279.
8586 40 MHz PowerCache IIci. . . . . 949.
8585 50 MHz PowerCache IIci. . . . . 1689.
8583 SCSI PowerCard. . . . . 1095.
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GDT Softworks
6256 PrintLink Collection 4.0. . . . . 59.
6151 JetLink Express 2.0 . . . . . 89.
8960 ParaLink Express . . . . . 99.
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6148 3½" DS/DD Disks 3 Pak *(30)* ..... 29.
3298 3½" HD Disks 1.44 Meg *(10)* ..... 19.
6375 3½" HD Disks 3 Pak *(30)* ..... 49.

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6592 44 Meg Removable Cartridge..... 75.

★MAXELL ... 60 day MBG

2792 3½" DS/DD Disks *(10)* ..... 13.
2793 3½" HD Disks 1.44 Meg *(10)* ..... 21.

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3943 DC2000 40 MB Data Cartridge.... 19.

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Curtis Manufacturing

8046 MVP Mouse ..... 89.

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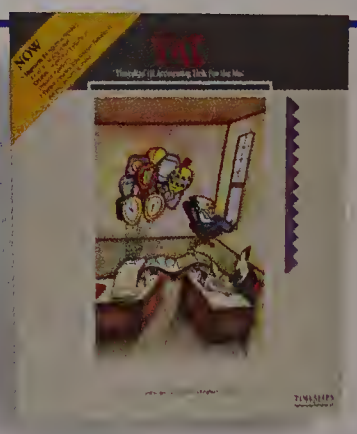
8198 "What Do I Do Now" Book..... 9.
2267 The Macintosh Bible *(3rd Ed.)*..... 19.



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Diana Robinson

Diana Robinson
Diamond Bar, CA

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other off-the-show-floor demo came from Ares Software, which showed FontMonger—the neatest type design and editing tool since Fontographer. Check it out.

Word Processors

WordPerfect demonstrated version 2.0 for the Macintosh, the company's best effort and the most-anticipated word processor on the Mac at present. DeltaPoint showed its word processor with graphics, called Taste; awful name, great product.

Spreadsheets

Microsoft announced a new version of Excel for the Macintosh with some features I personally appreciate, like the ability to more easily identify formulas or to invoke simple calculations more directly, and of course Wingz-style graphics. Sadly, the company introduced a richer feature set on its Windows version of the product. In fairness this is probably because Lotus Development Corporation is readying its Lotus 1-2-3 for the Mac at long last, and the product looks lean and mean.

Serius, the company producing developer tools, showed Serius Business, a new spreadsheet with built-in graphing capability that looks very interesting. Rather than focus on less-than-useful, 3-D, pretty pictures, the company tried to address the graphing needs of people who use a spreadsheet. It certainly is no competition for Excel in calculation capability, but if you want to work with text, lines, and formats in spreadsheet cells in combination with graphics, you should look at this product.

All of the major database companies had something to show, but databases seemed somewhat moribund. Microtech International announced a handsome group of memory peripherals for Next machines. And Everex showed a scanner.

That's All, Folks

If you want the location of a company mentioned here, try looking it up in our product databases on AppleLink (international) or on the *Macworld* forum on America Online. And if all else fails, write me and I'll find it for you. M

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Taco Bell is an international quick-service restaurant chain headquartered in Irvine, California. Its graphic design division supports corporate communications efforts serving its employees around the world. In 1990, Taco Bell won the International Association of Business Communicators' Special Communications Award, for the Pepsico *Sharepower* Magazine, produced with QuarkXPress.

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Turn your Macintosh into your own Personal Color Workstation with an E-Machines 16-inch display. ColorPage T16, the full-page 16-inch Trinitron display judged best for two years running by *MacUser* Labs, ★★★★ gives a whopping 70% more working space than you get on an Apple 13-inch RGB, one full-page including the margins. That's room enough to view an entire year's budget or a complete presentation slide at a glance. E-Machines' TX , the two-page 16-inch Trinitron display packs 19-inch

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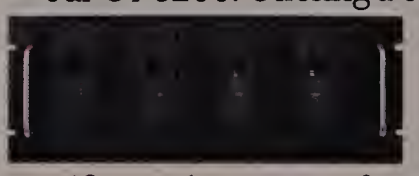

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LETTERS

WARD SCHUMAKER

Ethical E-Mail

Prodigy's editorial control of E-mail is a blatant example of how corporations, by owning the means of communication, can stifle the free exchange of ideas [*The Iconoclast,* January 1991]. Prodigy should be boycotted by anyone who is uncomfortable with being told to shut up and shop.

Technological advances will be accountable to human needs only if humans make them accountable. Steven Levy deserves the highest praise for his sensitivity to the ethical issues involved in online services. *Macworld* deserves thanks for providing Levy with a national platform. Prodigy's censorship deserves greater public exposure and debate.

Eric Hebs
Fort Worth, Texas

Censored Comments

Regarding Steven Levy's January 1991 article, "In the Realm of the Censor," I would like to relate my experience with Prodigy. I am an assistant sysop on CompuServe, and help run a beer and home-brewing forum on CIS. We had an interesting thread going about Prodigy a while back. It seems that whenever anyone so much as mentioned anything with the word *CompuServe* in a Prodigy message, the censors would delete the message. These guys were simply explaining that there was a beer and home-brew forum on CompuServe. As it stands now, there is no way to even tell these poor sods that an alternative exists. Talk about trying to eliminate the competition.

Dan Fink
via CompuServe

Prodigy Has Its Say

Prodigy never intended to build a high-volume E-mail network, or a no-holds-barred bulletin board. There were plenty of those already. The Prodigy service was founded on three key marketing principles: give the service broad appeal, make it easy to use, and make it inexpensive. It's incredible that Steven Levy can say that compared to time-metered online services and other modes of long-distance communication, 25 cents to send a four-page personal message is "prohibitive" and "onerous." Prodigy is simply recovering the costs incurred by a small minority so we can keep the cost to the majority a bargain at $9.95 a month in the annual subscription.

Prodigy is a family-oriented electronic publisher. As such, we exercise editorial discretion over what appears in public areas of the service. Like *Macworld,* Prodigy does not guarantee publication of anyone's comments.

Here are some examples of member comments we've chosen not to publish: "Here's how to avoid paying for HBO: climb the telephone pole outside your house and . . ." "You can't get pregnant if you don't have an orgasm." Censorship? We don't think so. That's just caring about our customers.

Ultimately, the marketplace will decide what it wants. In the first 90 days after message charges were announced, the number of Prodigy service members mushroomed by a quarter million to more than 700,000.

Brian Ek
Prodigy
White Plains, New York
(continues)

Corrections

Nuvotech's TurboStar supports 16 ports, rather than the 12 we stated in the table "Other Network Products" ("Networking for the Novice," December 1990.)

Cactus Computer sells the following StarBurst products ("Networking for the Novice," December 1990)*: 16-port, 16-position RJ-11 connector panel $549; 16-port, 64-position RJ-11 connector patch panel $699; 32-port, 64-position RJ-11 connector patch panel $1148; 48-port, 64-position RJ-11 connector patch panel $1597; 64-port, 64-position RJ-11 connector patch panel $2046; and 16-port, 12-position 50-pin connector and 4-position RJ-11 connector panel $549.*

Steven Levy replies: Brian Ek's comments only confirm what I said the Prodigy service was—an online service that denies the promise of telecommunications by limiting the interactivity of its users. My column did note that when Prodigy was conceived, the communications services were consciously given short shrift. This is why the system architecture makes it fairly costly for users to send E-mail to each other. If the U.S. government can physically transport a first-class letter across the country for 25 or even 29 cents, isn't it reasonable that a computer system could move a few bits around for much less? Next, Prodigy costs not $9.95, but $12.95 a month unless users pay a year in advance. Finally, Prodigy's "editing" goes far beyond the extreme examples cited. Users report their comments have been quashed for political content, for instance. And even G-rated comments that are deemed contrary to Prodigy's business interests are not permitted. That's not "caring about our customers" but censorship.

Silicon Valley Hamlet

Regarding your January 1991 cover picture of John Sculley, is that "Warrior King" or is it Hamlet?
F. A. Slattery
Santa Monica, California

Macworld Said What?

When I first read the "Year in Review" and came across those uncensored words, I laughed until my sides hurt. I think it is great that *Macworld* let the four-letter s-word by. It was appropriate and humorous. Besides, who at Apple does not say that word?
Sinistar
via America Online

Review Revolt

Here is my review of your "Year in Review." Both of the subscriptions coming into my office will be canceled as a result of the profanity in the article.
James E. Talmage
Byron, Georgia

Paper Chase

I am seriously concerned about the amount of wood that has to be cut down for the five or six renewal/subscription cards you put in each *Macworld* magazine. I recently discovered that you use roughly 809.4 square centimeters of card stock for these forms per month. If your circulation is indeed over 340,000 copies per month, that amounts to approximately 3,308,577,904 square centimeters, or more than 1485 metric tons, of card stock just for the magazine's renewal/subscription forms.

This may mean nothing to you, but it means a lot to me. I suggest you think about what you are doing to our adulthood and to our children's future by this misuse of resources. Most people put these notices directly into the trash. I certainly hope you are not using Canadian trees, because we need our forests for more than garbage.
Andrea MacNeish
Vancouver,
British Columbia

As a magazine, we are very concerned about the environment and have recently founded a program we call Macworld Earth Conservancy, with the mission of promoting ecological responsibil-
(continues)

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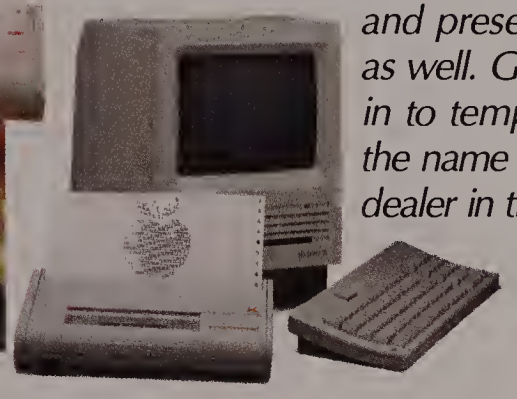

Macintosh computer and new Kodak Diconix printer

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KODAK

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ity among *Macworld* readers, employees, and advertisers. One of our projects is the Macworld Grove tree planting and habitat restoration, on which we're collaborating with the California Nature Conservancy. We have also recently reduced our print order to the barest minimum, and will monitor our needs to see if further reductions are possible.—Ed.

Stymied by Style

While I am willing to respect Rod McKuen's high praise for the Discis Books [*Reviews,* December 1990], I'm simply not willing to allow my "eight-year-olds and up" to be taught that *Thomas'* is the correct possessive form of the name —or that poet sean o huigin sets a good example of correct capitalization of proper names. I deplore the fact that a "Knowledge Research" company contributes to the degradation of the language.

Phil Martin
Tuftonboro,
New Hampshire

The possessive of Thomas that you mention was not produced by Knowledge Research but by the editorial staff at Annick Press in Toronto, who published the book. The editor we spoke with there said that when in doubt, they use the Queen's English, and that *Thomas'* followed by a word beginning with an *s* (snowsuit) falls into that category. About sean o huigin, you won't find our editors listed that way on our masthead, although we might have to reconsider if one of them were named e. e. cummings.—Ed.

Color Comparison

We at Adobe want to comment on Lon Poole's recent comparison of Letraset ColorStudio and Adobe Photoshop ("Pictures Perfected," January 1991). The article states that Tom Knoll, one of the authors of Photoshop, achieved more believable results in one hour with Photoshop than creators of ColorStudio Mark Zimmer and Tom Hedges did in two hours and 20 minutes and than Letraset employee Tony DeYoung did in two hours with ColorStudio. Despite a clear explanation of the retouching techniques used by both teams, Poole credits operator skill as the sole reason for the superior results achieved by the Photoshop team.

While John Knoll is, admittedly, a competent retoucher, we think the article's conclusions ignore the very evidence this test was supposed to bring to light: which product performs best for this type of retouching work. We think the printed results of this comparison speak for themselves. Unfortunately, the article still leaves readers a bit confused and leaves it up to them to make their own decision.

Steve Guttman
Mountain View, California

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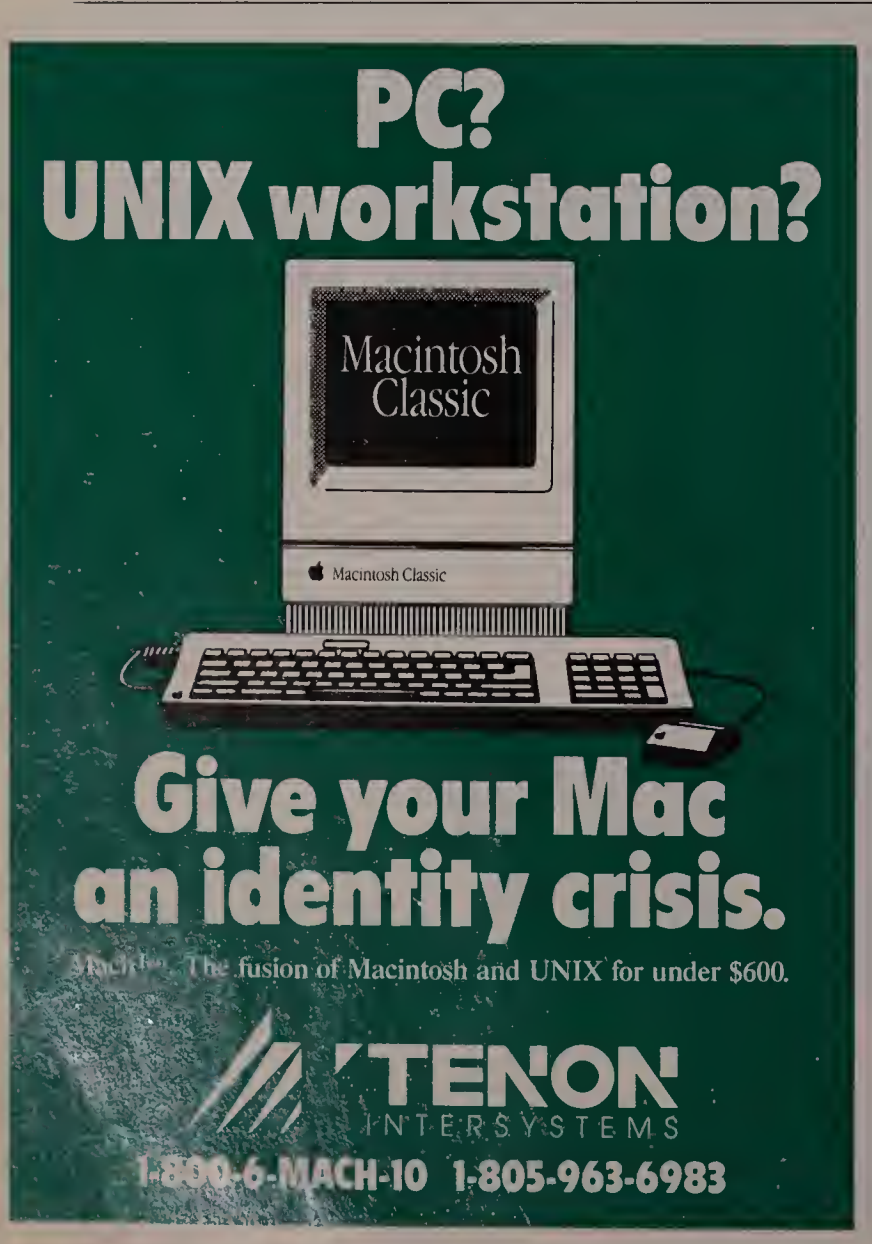
Letters should be mailed to *Letters, Macworld,* 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370, 702) or MCI Mail (294-8078). Include a return address. We regret that, due to the high volume of mail received, we're unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld.* M



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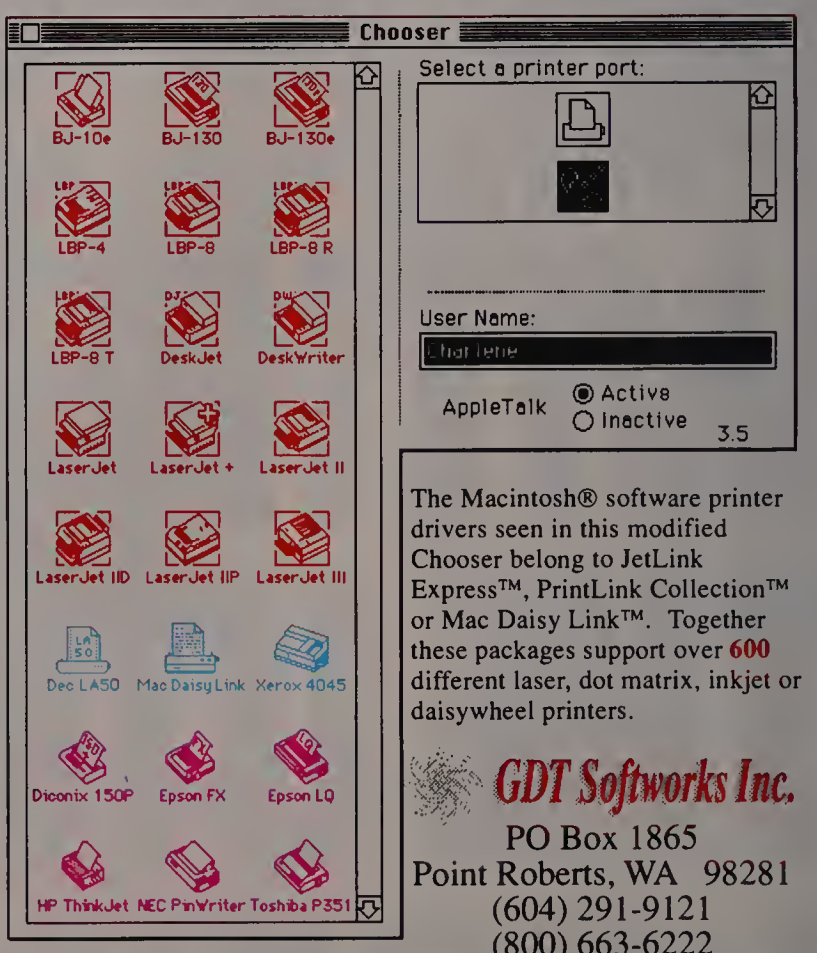

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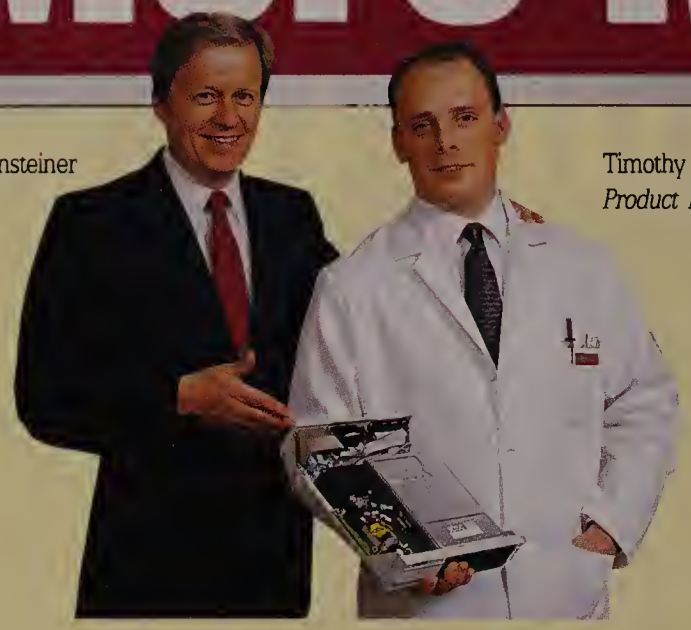

Ronald E. Eibensteiner
President/CEO

Timothy R. Maroushek
Product Manager

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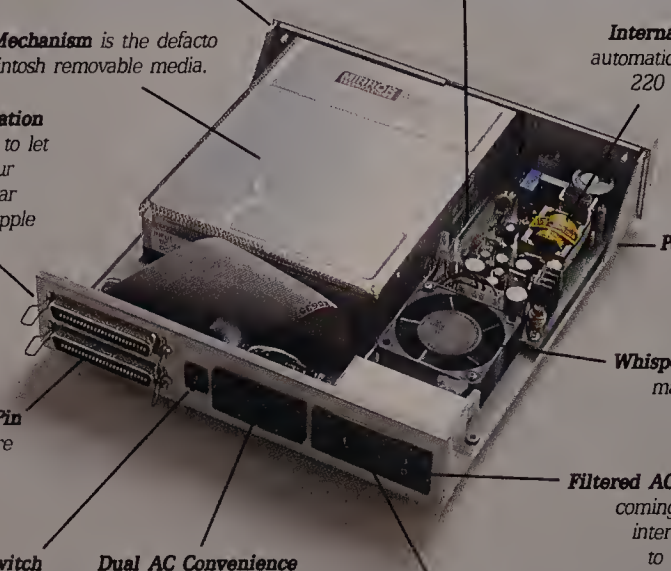
"Recently, our RM42 SyQuest drive was awarded 4 mice by the editors of MacUser magazine. When Tim Maroushek, our Product Manager, was given the challenge of designing the new M-series line, he didn't design it with awards in mind. His objective was to build a superior quality drive with the latest technology, and to do it at prices that would represent the best value in the marketplace. After all, as Tim says, "...the 4 mice rating is great, but I'd rather make a difference by creating a better value at a lower price."

We feel that the recognition we're receiving is a direct result of the feedback from our customers and the editors, coupled with the attitude and efforts of our development team. Together they were able to take the feedback we'd gathered and design and build the M-series line into the best value in the marketplace.



So how were we able to design so much into our drives and still offer such competitive prices? The answer is our factory-direct strategy. By cutting out the Dealers' mark-up and the Reps' commission, we both save money. As always, you have my 30 day "love-it-or-return-it" guarantee. So take advantage of this risk-free opportunity to find out for yourself why our drives deliver more mice for the price. Order Today! Most orders ship the same day, so you could be using your new Mirror drive tomorrow."

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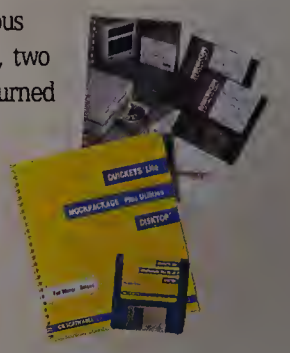

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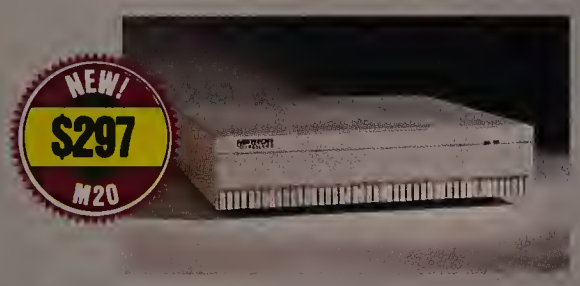

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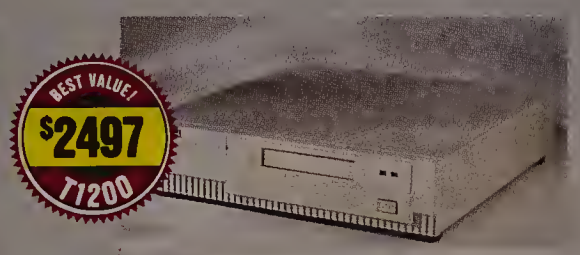

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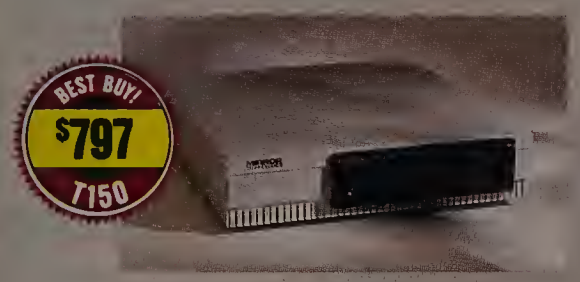

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MP80	80Mb	$567	$ 617
MP105	105Mb	$617	$ 667
M130	130Mb	$647	$ 747
M180	180Mb	$767	$ 877
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MP designates a Quantum drive mechanism.

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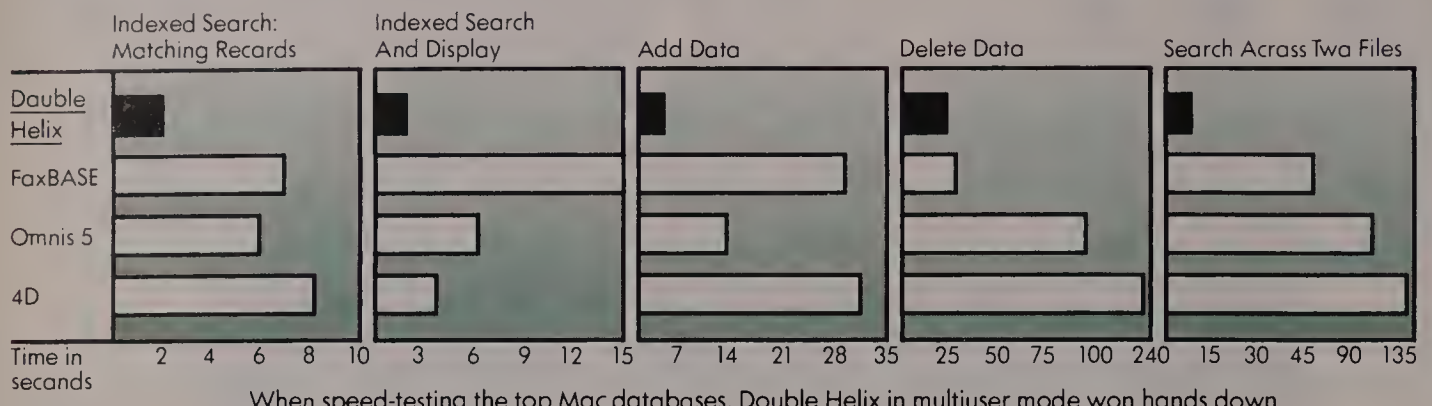
Since we know you're pressed for time, we'll skip the standard introduction and get straight to the point.

■ Double Helix is the fastest multiuser relational database for the Macintosh.® This, you should know, is not our personal assessment, but rather the conclusive results of MacUser magazine's June 1990 speed-test. And of the four top databases, in five key commands, Double Helix finished first. By considerable margins.



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Not just built for speed: "Double Helix is the most user-friendly database currently available." MacUser, June 1990

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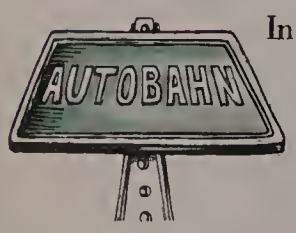

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Double Helix

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Circle 238 on reader service card

ART BEAT

by Cathy Abes

The tools and the talent behind Macworld's graphics and the techniques that make them possible

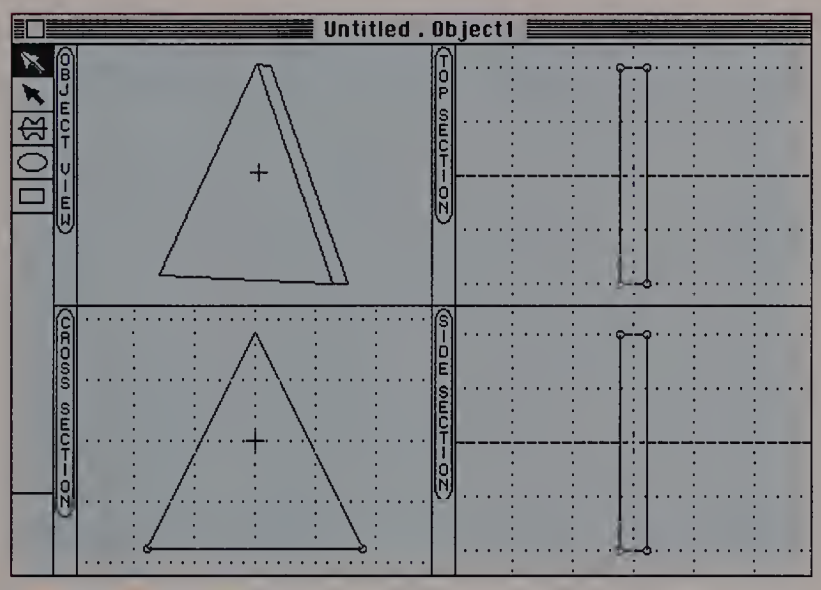
Artist: A veteran *Macworld* illustrator who has used PixelPaint Professional and SuperPaint extensively, Scott Baldwin decided to try using Paracomp's Swivel 3D Professional about six months ago and has since used it to produce four illustrations for *Macworld*.

Hardware: Mac IIcx with 8MB of RAM and a 105MB Cirrus internal hard drive, SuperMac ColorCard/24, Kurta 12-inch-by-12-inch graphics tablet, Jasmine Removable 45 (SyQuest) drive.

Software: Swivel 3D Professional; Adobe Photoshop; PixelPaint Professional.

How It Was Done: For the illustration that opens our "Getting Started with Hardware Upgrades" column, Baldwin began in Swivel 3D Professional by creating the red engine block. He used the Extruded Object tool to create an object that he could then edit into the shape he wanted. Once the object was created, he worked on it in each of the four views Swivel provides: Object View (a wire-frame representation showing the object's position in the real world); Top Section; Side Section; and Cross Section.

Baldwin used Swivel's ability to embed objects within other objects for making the fan that's attached to the engine block. After he created the fan's central cylinder, Baldwin created one blade and duplicated it three times. Then he dragged all four blades toward the cylinder until they intersected it. Once the blades were embedded in the central cylinder, Baldwin examined them from different views—front, side, and top—to see how they were positioned relative to one another in three-dimensional space. After rotating each blade until it was accurately positioned, he used Swivel's Lock Link tool to lock the blades together so they would stay in the same position relative to one another when he moved them around—as if they were glued together.



These are the four Object Views the artist began with when he used Swivel 3D Professional's Extruded Object tool to create the engine block.

After editing the object in each of the Object Views and assigning it a color, he ended up with the finished engine block.

The chains were made by creating the first link, duplicating and rotating, and repeating the process until the chain was complete.

Like the engine block itself, the circular air cleaner that sits on top of the engine block was also made using the Extruded Object tool. Baldwin edited the Cross Section view by making it into a Q shape: starting with a circle, he pulled out a little piece of it to make the tail of the Q. The top and side sections were rectangles whose proportions he altered slightly. The smaller circular object that sits on top of the larger one was created as a circle in the Cross Section and as rectangles in the Top and Side views, which made it a cylinder. To attach the cylinder to the Q shape, Baldwin grabbed the cylinder and moved it sideways and up and down in space until it was in the right spot, and then he embedded it in the Q shape. Finally, he locked the two objects together as he had with the fan blades.

To create the chains, Baldwin first created one link of the chain, then duplicated that and rotated it 90 degrees relative to the first link and duplicated those two. He continued duplicating chain links and changing the angle of each link until the entire chain was created. Then he used Swivel's ability to link objects together to make all the chain links into one composite object—the entire chain. That enabled him to move the chain around without changing the individual links' shape, proportion, or position relative to one another. To wrap the chain around the engine block, he rotated

(continues)

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The air cleaner began as a cylinder from which a small extension was pulled out. The smaller cylinder was created separately and embedded in the larger one.

the three lowest links on the right side until they appeared to encircle the engine block. Once the chain was precisely positioned, he locked the links to one another and the entire chain to the engine block to eliminate any chance of their being moved accidentally.

After he had created all the objects, Baldwin used Swivel's six World Views (right, left, top, bottom, front, and back) to help position the objects accurately. To further fine-tune their positions, he then used Swivel's View Angles feature, which simulates different types of camera lenses: Wide, Very Wide, Moderate, Narrow, and Orthographic. Baldwin used this last view because it eliminates depth-of-field distortion, making it easier to align objects.

Once all the objects were properly positioned, Baldwin added color. In a Swivel file, you can use up to 16 different colors and a range of lighter tints and darker shades of each color. Each object can be assigned one color as well as what Swivel calls an environment map, which is actually a two-dimensional surface such as wood or chrome that is combined with the color and mapped onto the 3-D object.

The Macintosh shape started out as a cube in Swivel. Because he couldn't create the Mac's recessed screen and inside view in Swivel, Baldwin created them in PixelPaint Professional. Under Swivel's Effects menu, he chose Anti-Alias to smooth out the edges of all the objects. Next he chose Paint-Type and 24bit PICT under Output Style (Edit menu), then Export File (File menu). As a result, the file was saved as a 24-bit PICT file with antialiasing.

In PixelPaint, Baldwin added the screen and the inside of the Mac, the background, the rivets on the engine block, and the black oil slick coming out of the engine. He also did the gradations on the fan blades and cleaned up various edges. Finally, he made a few minor color adjustments in Adobe Photoshop. ■

The final Swivel image lacks a few details, most notably the Mac's screen and recessed interior. Also missing are the rivets on the engine block.

The final image after the missing elements were added in PixelPaint Professional and minor color adjustments were made in Photoshop.

RasterOps 8LC Display System and 24si Display Board

Ad produced on the Macintosh

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Circle 313 on reader service card

Tea for Two

A TALE OF CORPORATE INTRIGUE INVOLVING SONY AND APPLE

BY STEVEN LEVY

It was a lofty ethical struggle, all right, when I was offered an all-expenses-paid junket to Japan, courtesy of the Japanese Trade Ministry. Would I be compromised by the cushy first-class accommodations, and perhaps the stray geisha? After a deep examination of my soul (which consumed somewhat less time than a font change on a 10-page Word file), I decided of course not! Even if I was, well, just a tad sullied by the proposition, could I really in good conscience deprive my readers of the opportunity to benefit from my newfound knowledge of the Land of the Rising Sun?

Certainly not! Oh, the sacrifices I make. And my instincts paid off. If I had taken the so-called high road and remained home, I would not be reporting the biggest scoop of my career.

How big? Read on.

This most extraordinary encounter occurred on the single free afternoon we reporters were allowed in Tokyo. I planned to spend it, like every other technology journalist who visits Japan, in the legendary Akihabara, the quarter of the city that specializes in electronics. I had heard that this was Wirehead Heaven, with every storefront brimming with esoteric and unspeakably cool items not yet rolled out in the United States. Indeed, it was everything I had hoped. I had already purchased a candy-apple-red IceMan—a pocket refrigerator powered by two AA batteries—and was pondering whether to purchase the Digital Pen—a fountain pen that could input computer data and reformat it into illegible handwriting—when I received a gentle tap on the shoulder.

MARK JASIN

I turned to find three men in business suits smiling and bowing. "Are you Levy-san?" one asked.

I admitted as much.

"Please accept an invitation to tea from Mr. Akio Morita."

"You would not be referring," I asked, "to the chairman of Sony?"

The three men nodded vigorously. They led me to a waiting limo, and after a brief ride I was escorted to a large glass-and-steel building and told to take the elevator to the 39th floor. To my astonishment, when the doors opened I found myself in a large, high-ceilinged space in which a traditional Japanese rock garden had been constructed many stories above the city. Kneeling in front of a tea bowl was the familiar figure of Morita, who had built the vast Sony empire. He looked up in welcome.

The Art of Tea

Fortunately, I have been trained in the art of tea, and knew how to make my way across the room, kneel properly, and utter the appropriate praises about the setting. "That tea bowl," I said, "is profound yet insouciant. Kind of luxuriously nonchalant." He beamed his approval at my

(continues)

grasp of the subtle contradictions inherent in his culture. After we executed the elaborate, centuries-old tea ritual—altered only by the fact that the tea-making apparatus, apparently a result of very-large-scale circuit integration, was the size of a postage stamp—we ceremoniously smacked our lips and talked business.

"What do you think," he asked, so softly I was straining to hear him, "of Sony Corporation owning Apple Computer?"

In true Zen fashion, I responded to his question with a query of my own. "Are you planning a takeover of Apple?" I stammered. I held my breath anticipating his reply.

"No," he said.

I let my breath out. I sipped the tea.

"We already own it."

I spit out the tea.

"We have owned Apple Computer for several years now," said Morita. "It was a major stock transfer, executed secretly. The Apple executives cooperated, mainly because they realized that Apple would be unable to continue its executive salaries and perks indefinitely. After all, the cash reserve was only a billion dollars or so—and the way executives move in and out of Apple, who knows how long that would last? Since Apple very much valued its reputation as a company whose executive salaries are the envy of its more rational competitors, the officials decided that they would link with Sony. Also, they figured that if we owned them, they would never have to design their own disk drives and repeat the Lisa debacle.

"As far as Sony was concerned, we had long coveted the company. Besides, those of us who use a Macintosh couldn't figure out any other way to get customer support from Apple. Every time we called them with a problem, they said, 'Go to your dealer.' So we decided to buy them, and now the people in Cupertino are our employees. Now they not only help us when we have a system crash, but they accept our calls collect."

I've Got a Secret

"That is impressive," I said. "But why was the deal done in secret?"

"We very much feared the reaction of the American people. After all, Apple is a legend, as American as Rockefeller Center and Bruce Springsteen. The two Steves in a garage, and all that. If Americans felt that the Japanese owned its computer industry, there might be trouble. So we devised a scheme. We would clandestinely buy Apple but then arrange it so that the company would be so poorly managed that its value would sink. Only then would we appear as a white knight, saving American jobs."

I wanted to know what he meant by mismanagement.

"Take for instance Apple's marketing. Even a simpleton could understand that the main advantage of an Apple computer was its interface—its integration and its ease of use. All one would have to do was explain to

(continues)

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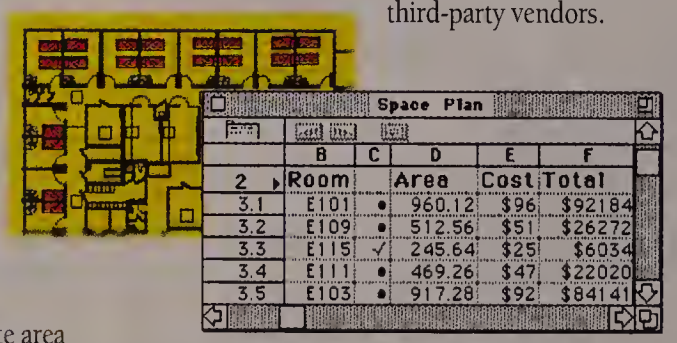

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Movie Shorts

Volume VII, Number II October 1990

Modern Day Boom Towns

Hollywood's raid on suburban America is making money for merchants. That's why vendors don't balk at the inconvenience of having directors, cinematographers, actors, and teamsters swarming around quiet city centers. Film crews on location bring staggering movie budgets that translate into staggering profits for local retailers. In many instances, businesses notice a 320-350% increase in sales. Here are a few overnight success stories:

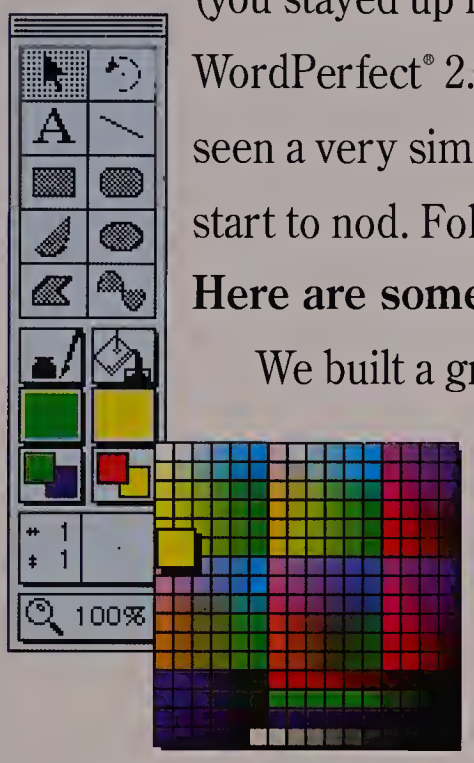
Teaneville, Oklahoma

To film the 11-minute binging scene in *Tomorrow We Dine*, director Michael Grayson required 2 weeks of shooting and 52,200 doughnuts, 600 gallons of chocolate milk, 700 loaves of cinnamon bread, 3,000 pastries, and 29 bran muffins. The gluttonous order amounted to 4 months' worth of sales at Georgia's Glazin' Goodies

Pg 1 Ln 2

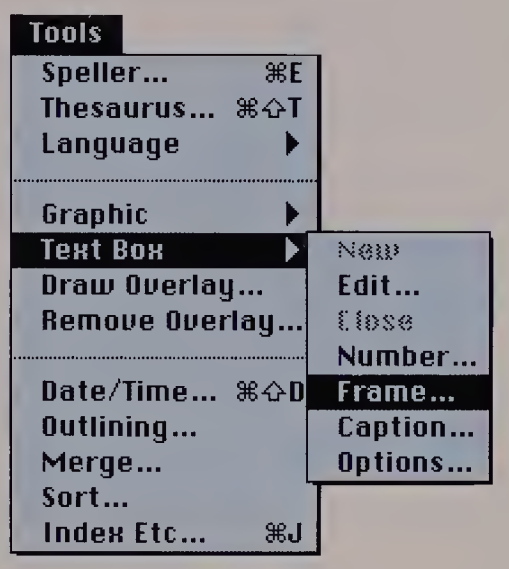
Introducing WordPerfect® 2.0.

Every once in a while a new product comes along that sparks the same kind of excitement you may have experienced with your first Macintosh (you stayed up half the night, right?). As we've shown new WordPerfect® 2.0 to Macintosh users around the country, we've seen a very similar reaction. First eyes open wider. Then heads start to nod. Followed by grins that stretch dimple to dimple.



Here are some of the more graphic improvements.

We built a graphics and drawing package right into the program. With WordPerfect 2.0, you don't have to leave your document to incorporate graphics. You can create, edit, size, scale and crop graphic figures just by clicking "graphics" or "draw" on the pull-down menu. The palette includes all of the standard drawing tools, plus Bezier curves, polygons and a free rotation tool.



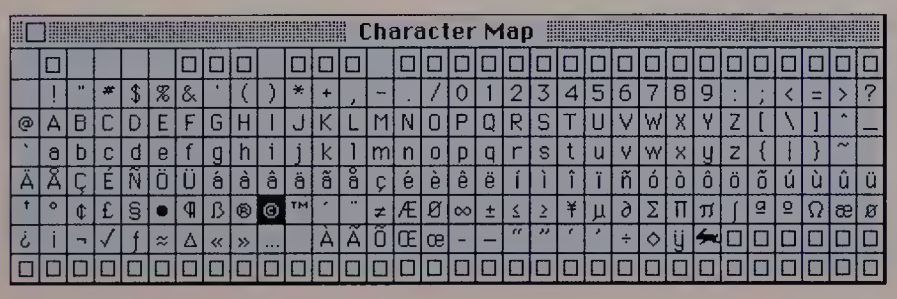
WordPerfect 2.0 also lets you create text boxes. Inside your text box, you can change font size and attributes. Then you can drag your text box wherever you want in your document and the rest of your text will wrap around it automatically.

The list of new features could fill a page. Or up to 24 columns.

By clicking and dragging icons on the new WordPerfect ruler, you can

create columns (newspaper or parallel) and then adjust the column settings, align text, set tabs, change line spacing, move margins and do a number of other formatting changes to your document.

Want to add a border to text, paragraph, column, or page? Easy.



WordPerfect 2.0 gives you 36 different border styles from which to choose.

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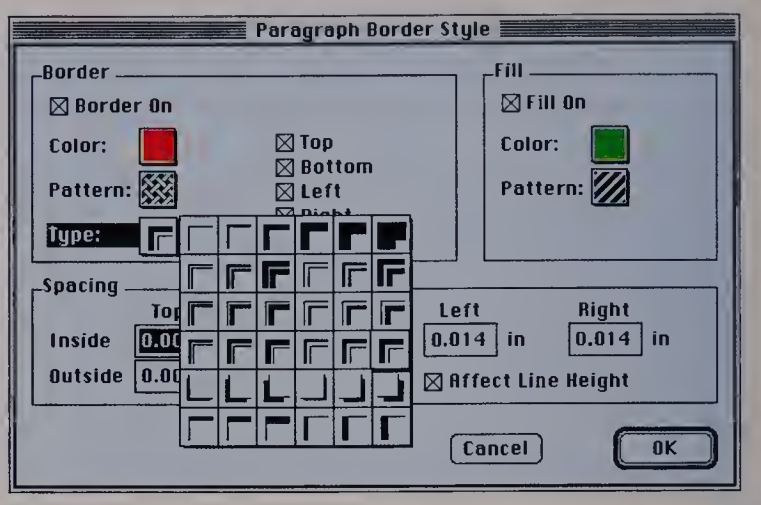

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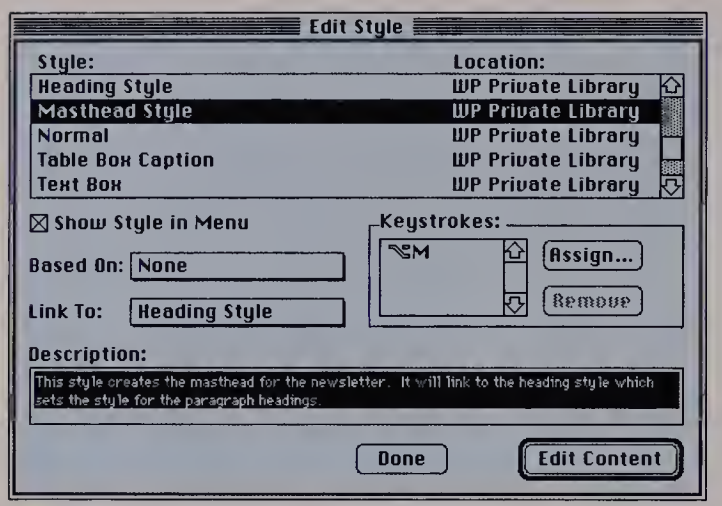

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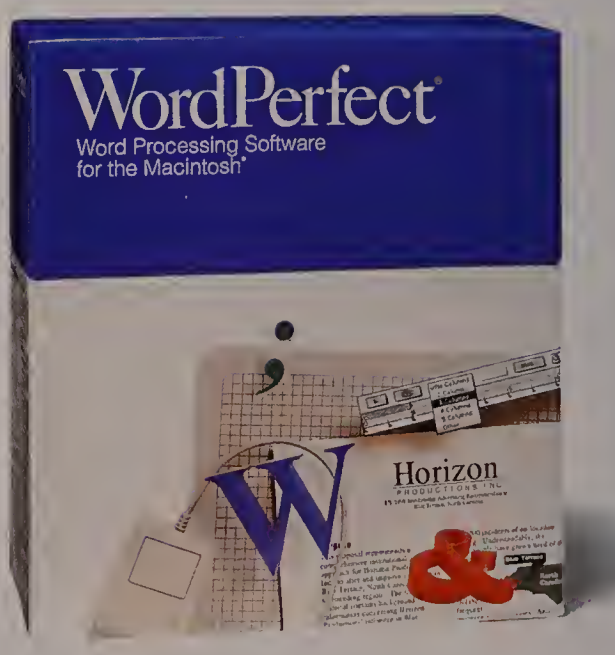

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the consumer why Macintoshes were superior. Then everybody would want one, and people in business who didn't use a Macintosh would suffer shame. But instead of that, Apple decided to show pictures of cars that flew."

"Gee," I said, "I thought the misguided advertising was just the kind of blunder that any big company could make."

Morita snorted. "Hah! Do you really think that a marketing genius like *John Sculley* would make such mistakes? He is the mastermind of the Pepsi generation! He approaches marketing as an art form, much the same way Leonardo painted. Haven't you read his book? It's all in there. Don't insult him by thinking that he could err so thoroughly in selling his computers."

I conceded the point. But I asked for more proof of this astonishing scheme.

"Surely. Every Japanese businessperson knows the major advantage we have over Americans. It's not that we work harder—in fact, we have been constantly astonished at how Apple employees, at least those who actually work with computers, spend all their hours at work. No, American businesses suffer because of lawyers who draw managing and creative energy into meaningless legal battles. So at Apple, we simply let the lawyers run wild. They sue everyone in sight. And they insist on approving everything that happens at Apple. And with the lawyers dictating the security rules at Apple, we've managed to make the employees all paranoid!"

I agreed there was no better way to stop a company dead in its tracks than to unleash the lawyers.

"But you know what was really funny?" Morita said thoughtfully. "Some of the lawsuits were launched just to tangle things up—and to our surprise they weren't thrown out of court! Who would have thought that our copyright claims to the Mac interface would still be alive, when at the same time Xerox has been denied any claim to copyright—and Xerox invented the interface! Really, your American legal system is remarkable."

Mysteries Resolved

The plan was indeed ingenious. "And if any of the executives figured out what was happening, it didn't matter," said Sony's Big Sushi. "They were gone in the biannual 'reorganization'!"

"So that's what happened to Gassée," I said. "But Akio-san, tell me, does the Macintosh Portable figure in this?"

"Naturally. Of course we had to lend Apple some of our expertise in devising small-scale technology. As novices in making portable computers, the Apple engineers couldn't have possibly figured out how to muck up a product so thoroughly without some guidance. So we concocted a plan for the ideal portable and had them do the opposite."

I thanked him for explaining that mystery; previously I had been unable to make head or tail of Apple's poor excuse for a portable computer.

(continues)

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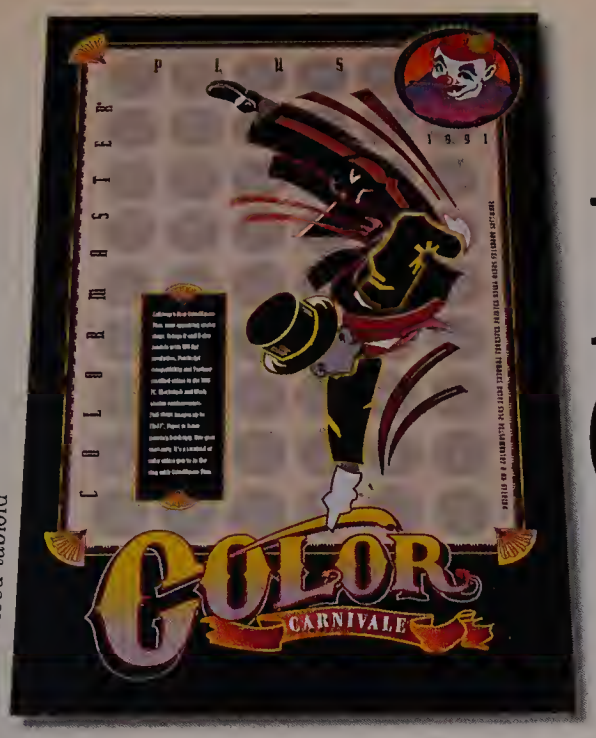

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"But wait a minute," I said. "What about the low-cost Macs? That seemed a pretty smart thing to do. How does that fit into your plan?"

Morita looked pained and fell silent for what seemed an eternity. Finally, he spoke. "Levy-san, you have correctly perceived what has turned out to be our chief difficulty. Explaining it will require a story." He poured more tea, took a deep draught, waited for me to follow suit, and continued.

"The beauty of our plan was to be total integration of all forms of software—now that Sony owns CBS Records and Columbia Pictures, we can merge those forms of entertainment with the information-processing power of personal computers. But then we learned that by owning Apple Computer, we were unable to participate in those areas. This time the lawyers worked against us."

"Are you referring to the lawsuit filed by Apple Records, the Beatles' former company?" I asked. "The one where Apple Computer, in exchange for continued use of the name, signed away its rights to process music on computers?"

"The same," said the venerable master. "It could have ruined all our efforts. The only way we could settle matters was to take on a partner. And this new player felt that our efforts to weaken Apple were excessive. She insisted that we abandon the linchpin of our plan—to keep Macintosh prices high and never attain healthy market share. In order to placate her, we acceded. And now it will be years before the company is sufficiently weak for us to announce our takeover. Even the silly commercials we ran when the new computers arrived—the one where the teacher invokes the Industrial Revolution and fails again to explain why a Macintosh is a good computer—didn't discourage people. They want Macintoshes."

I sighed in sympathy.

"That's not all. We have to cope with the constant interference from this partner. Phone calls all the time. Try this, change that . . . it drives me wild. Even dropping in unannounced."

Double Fantasy

As if on cue, the elevator doors opened. Morita-san flinched. Through the doors walked a well-known, diminutive figure with aviator sunglasses—Yoko Ono.

"Akio, you don't fool me," she said, not bothering with formalities. "The reason why you can't supply dealers with enough Mac Classics is that you're still trying to weaken the company. Forget it! Let's get Apple strong again!"

"See what I mean?" he said to me.

Yoko hardly stopped for breath. "And those stupid advertisements—they ruined the World Series for me! Well, don't worry, I have a new jingle for Apple that will turn things around. It was dictated to me last night by John."

"John Lennon came back from the dead and dictated an Apple jingle to you?" I asked.

"No, silly, John *Sculley*. He's a marketing genius—haven't you read his book?"

I admitted that I had.

She pulled out a small Casio keyboard and began singing in that unmistakable fractured soprano:

"Imagine there's no Windows,
It's easy if you try . . . "

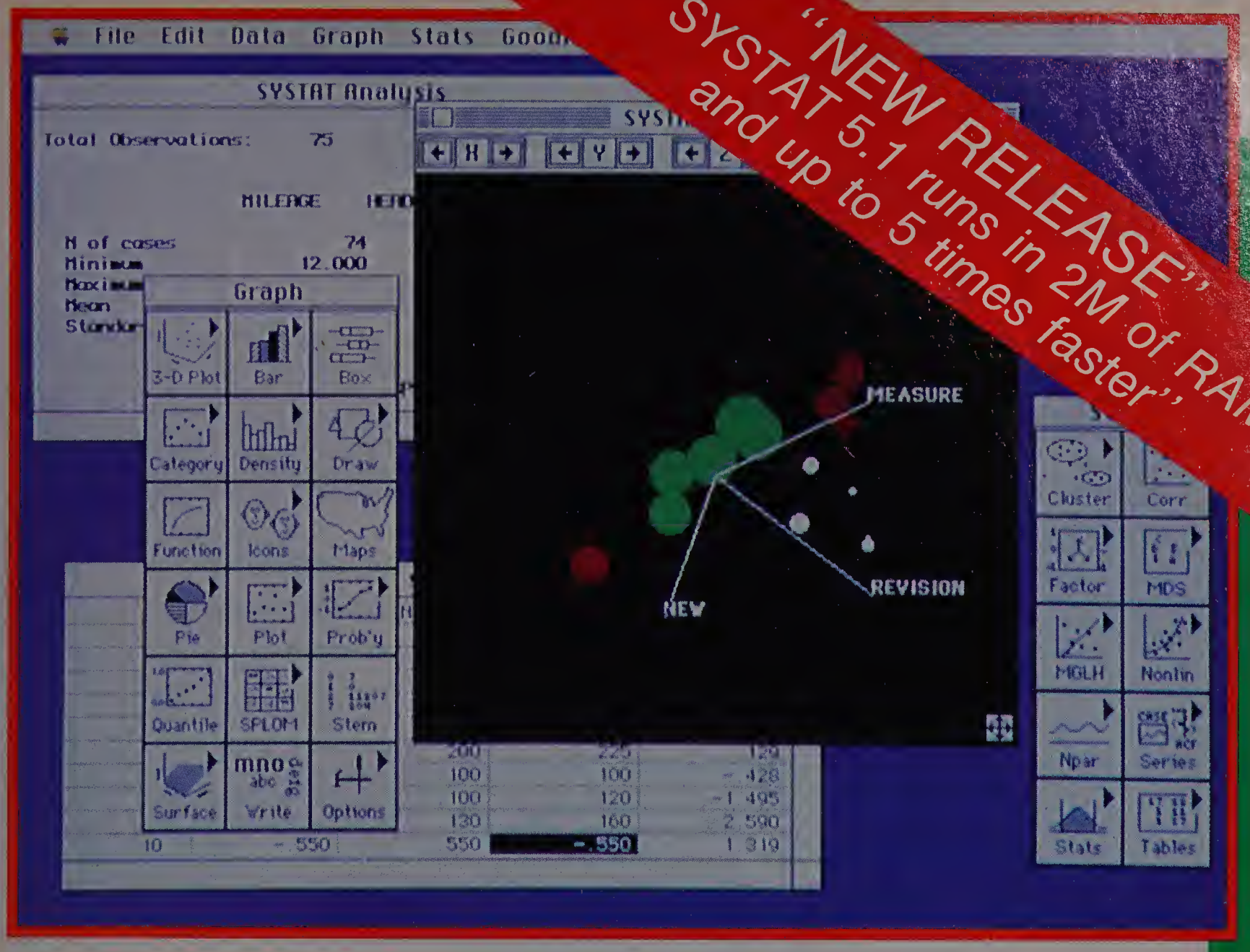
At that point Morita leapt to his feet, overturning the tea bowl. "Stop it!" he cried. "I said I would go along with the joke—but only if you didn't sing." He turned to me. "We don't own Apple. We never did. It's only an April Fools' joke! I'm sorry we had to put your readers through this."

"We had you going there, though, didn't we?" said Yoko, grinning widely.

I admitted that they did. We all had a good laugh, as good a laugh as three people can share considering that we were really not together, and that the rock garden 39 stories over Tokyo was only a knee-slapping construct of my imagination. After promising my companions that I would inform my readers several times—this is an April Fools' joke, this is an April Fools' joke, this is an April Fools' joke—I got up to leave.

It was time to defrost my Ice-Man. M

Steven Levy, a Macworld *columnist, is currently writing a book on artificial life.*



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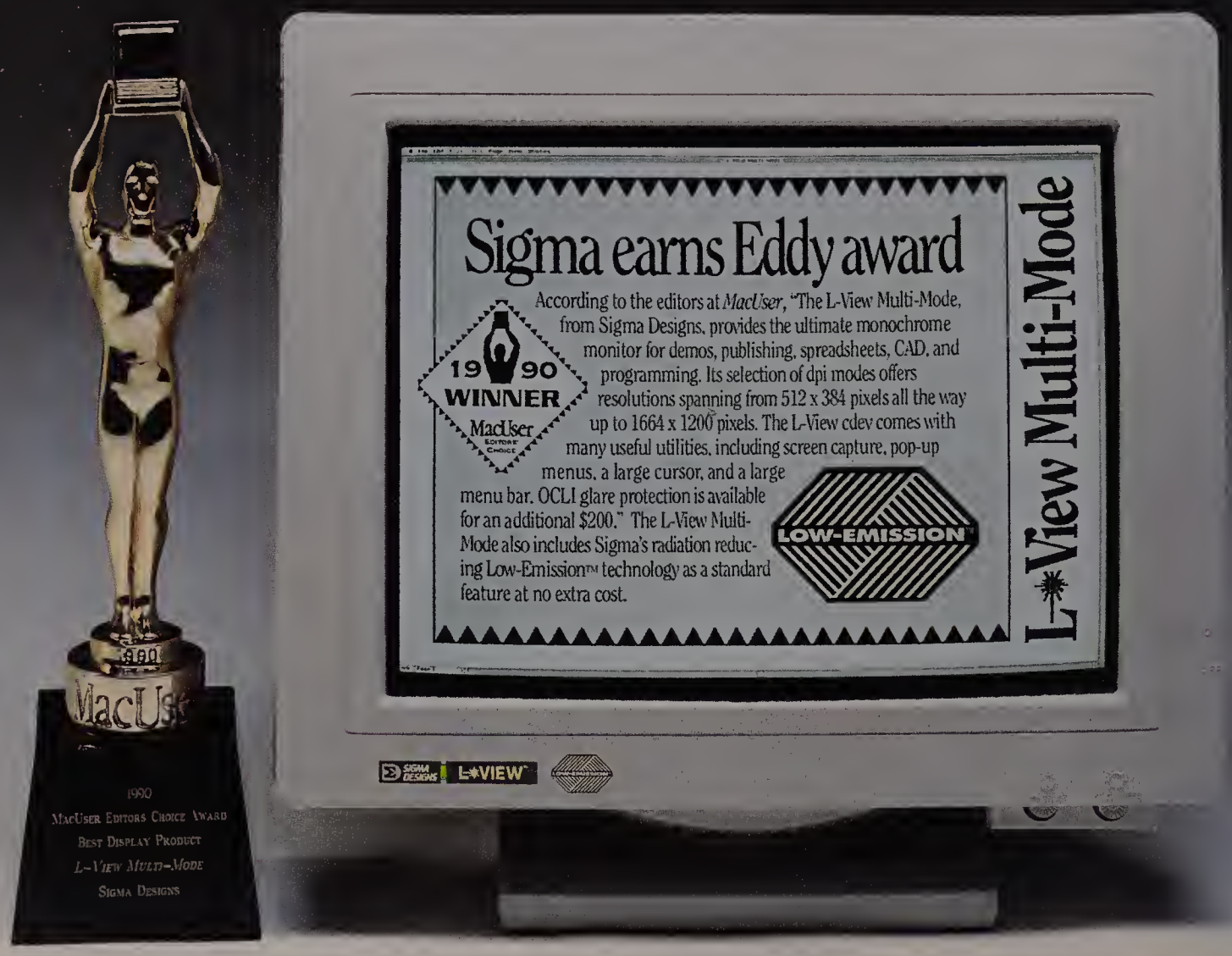

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Jasmine One Year Later

THE COMPANY'S MAKING MONEY BUT LOSING FRIENDS

BY DEBORAH BRANSCUM

Jasmine officials say that the company is back on its feet, making a profit, answering its phones, and providing good products at good prices. But some Jasmine customers say the company refuses to honor its warranties and is still impossible to reach. I met with Jasmine officials recently at their modest Sunnyvale, California, offices to get a progress report on the company and find out why consumer complaints continue to surface. The answer, at least in part, is that Jasmine Technologies is a different company, both legally and in practice, from the fat-cat vendor that was forced to file for protection from creditors nearly one year ago. The reorganized company moved from expensive new offices in San Francisco to more affordable space in Sunnyvale in October. The employees, some 125 before reorganization, have been trimmed over time to about a quarter of that number. And tech support and service have also been cut, all in an effort to bring Jasmine back to life.

DRAKE SOREY

Jasmine officials (from left) Marc Frouin, Nathan Schulhof, and David Guo show off the small Clipper drive.

In the process, Jasmine has essentially decided to cut its losses on old customers and concentrate on drumming up new business. During the reorganization proceedings in May, for example, new Jasmine officials pledged to honor the warranties on all existing Jasmine drives. But now the company says it can't do warranty work on its old 20MB model. Jasmine used a manufacturer's warranty from MiniScribe to cover repairs to its 20MB drives, but then MiniScribe itself went into bankruptcy proceedings and declined to uphold its own warranties. That put Jasmine in a tight spot. The MiniScribe mechanisms are difficult to fix and often break promptly after repairs, according to David Guo, Jasmine's product director. And up until November, Jasmine was still losing money and could ill afford to put cash into MiniScribe repairs. It's a matter of survival, according to the company. "We had to concentrate on new sales and new customers in order to break even," said CEO Marc Frouin.

That decision didn't endear it to *Macworld* readers like Rick Levine of Chicago. "I'm not asking for much," wrote Levine. "All I ask is they either honor the warranty [or] replace the equipment . . . so I can feel that the $1000 or so I've spent over the past three years with the company wasn't for nothing." After Levine wrote to several consumer agencies with his complaint, Jasmine repaired and returned his drive. But apparently some 220 other Jasmine customers won't be so lucky. According to Guo, about 30 percent of the 20MB model owners have opted to upgrade their drives at a discount representing savings of $70 to $140, depending on the upgrade. Other owners are being referred to DriveSavers (415/883-4232) of Novato, California, and Mipro III (415/306-1100) of Redwood City, California, for repair service. (DriveSavers charges $125 for the repair, with a 90-day warranty on the drive; Mipro charges $145, with a 9-month warranty on the mechanism.

(continues)

Circle 108 on reader service card

Jasmine says this is a short-term issue because the remaining 20MB drive warranties should have expired by February of this year. But that's not the only problem readers have complained about. Why has it been so tough to get through to tech support? Why haven't drives been repaired quickly?

According to Jasmine, the move to Sunnyvale created a backlog, but of greater impact was a vicious cycle that kept the tech-support lines busy. The department was overwhelmed by people calling to get the status of their drives—250 calls were coming in per day. "If we can't fix the drives, people are going to call, but if people call, we can't fix the drives," said Guo, who was hired in October to help solve the problem. He said that people hired to do tech support were spending two-thirds of their time making repairs.

Guo established a new tech-support policy to answer every phone call, even if it meant slower service, in an effort to improve service overall. So Jasmine implemented a call-back service late last year in hopes of "eliminating phone-tag and having the wrong person call back . . . And people don't have to worry about additional long-distance charges, since Jasmine returns the phone call," said Guo. (This was not Levine's experience in November, but I had no problems getting through when I called in January.)

Another change is in the breadth of tech support. "Jasmine tech support used to provide a lot of tech support on non-Jasmine questions, such as questions about software INITs," said Frouin. "Ninety percent of the time it wasn't about the drive. We're not a Macintosh-support organization, we're a Jasmine-support organization." Frouin argues that the small profit margins of the drive business can't support greater service.

"I understand why people are upset," said Nathan Schulhof, vice president for sales and marketing. "If I were a user, I wouldn't accept Jasmine's answer." Schulhof said that the company tried to repair the drives at first, but the drives often failed again, making customers even angrier at Jasmine after waiting months for a repaired drive. He told me that Jasmine officials do care about their customers, offer the best prices possible, and work hard to create new innovative products. With that, he showed me a prototype of Jasmine's nifty new pocket-size drive, which uses a 1-inch mechanism. He also discussed the inexpensive libraries of popular software that Jasmine will be offering as an option with its drives.

As I was writing this column, I called David Guo for an update. At that time there were 435 drives waiting for repair, not including the 20MB models—about a three-month backlog. Some 45 repaired drives had been returned to customers that day. On the same day I received a call from a reader who bought a portable drive from Jasmine. The drive arrived without a manual and with old Jasmine address and telephone information. "What's going on at Jasmine?" the reader asked.

Good question. Here's another one. Why did Jasmine quote different SIMM prices on the same day? Jasmine's supply of $39.95 SIMMs disappeared rapidly, so many readers of the January and February issues were quoted a higher price than that advertised. When pressed, Frouin said Jasmine would honor the $39.95 price until February 1. But when *Macworld* called to place an order on January 31, one salesman quoted a price of $44.95 per SIMM; another said the price was $54.95 per SIMM. (Current ads note that the price of memory may change.)

It's quite remarkable that Jasmine emerged from Chapter 11—few companies do. The new officials seem sincere, concerned, and determined; and none of them were part of the old Jasmine. They remind me again and again that this is a new company legally, a start-up, supporting a huge installed base, with very few resources but now making money to the tune of $1 million in monthly sales. Fair enough. But they promised to honor all Jasmine warranties, and now they've broken part of that promise. So here's a reminder that products aren't enough—service counts, too, and consumers don't have the same patience with the new Jasmine that they had with the old.

(continues)

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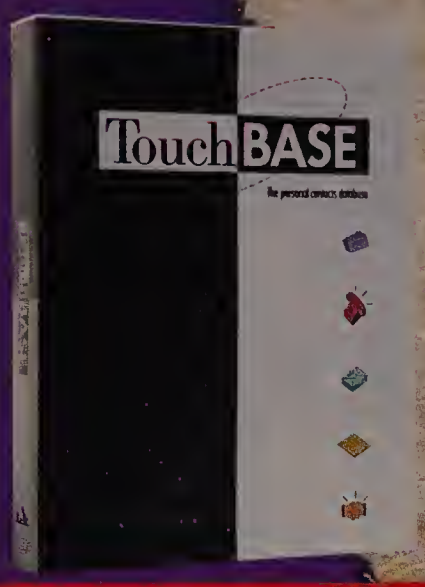

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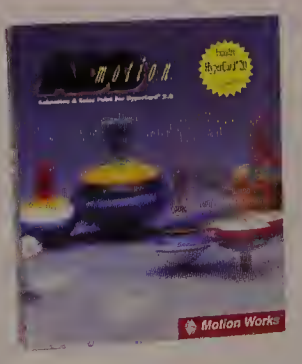

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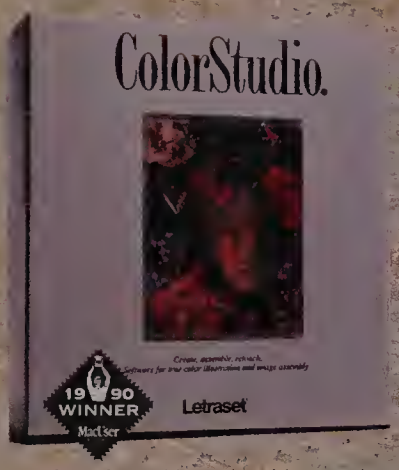

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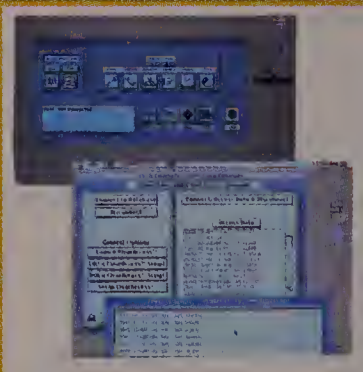

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In/Out (1-10 user) ..... 186.
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1-5 users ..... 207.
1-10 users ..... 307.
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Ethernet
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LocalTalk -
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Best Data Resource
3G Graphics Accents & Borders 1
The numerous borders, ornaments, labels, and symbols in Accents and Borders are crisp black & white and finely crafted. Unlike most clip-art offerings, all 3G images are opaque and most are strategically subgrouped for easy separation into more images or quick color changes. Bonus color disk for registered users.
Accents & Borders 1 ..... $64

Best Communicat... Product
Global Villa... Comm... Tel...

Best Animation Program
Paracomp FilmMaker
The Eddy Award winning FilmMaker is the masterful animation and multimedia graphics program. This amazing application allows the user to create professional quality presentations and animations quickly and easily! What takes hours to create in other applications can now be done in just minutes with FilmMaker. Whether you're a professional animator who wants to create stunning effects for video, or just someone who wants to put their ideas in motion – FilmMaker is the ultimate answer.
FilmMaker $438

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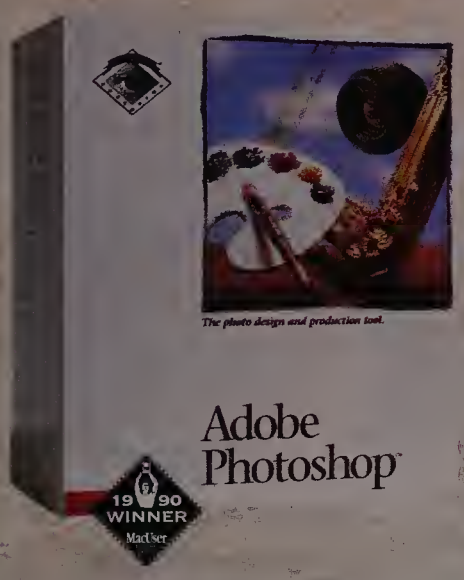
Shining stars for the 90's

1990 Eddy Award Winners

The Mac Zone Established 1986



Best Software Package of the Year

Adobe Photoshop 1.07

Adobe Photoshop is the affordable Macintosh image-processing program with enough power and versatility to be used as a paint, pre-press, color corrections and darkroom system. And it does is all in living 24-bit color. Whether you start with scanned photographs, slides, electronic art works of from scratch, Photoshop's full range of filters, painting, drawing and selection tools give you the artistic control and precision you've been missing.

Photoshop 1.07 .....$498

Best Connectivity Software

Farallon Timbuktu

Timbuktu links all the Macs on a LocalTalk network (with password protection). The Desk Accessory opens and closes files, and actually operates the software on another person's Mac. This makes Timbuktu especially good for training others on how to use an unfamiliar application. With version 3.1 you can now send files to others or let them copy to an from yours. And, you can operate files servers in distant rooms – from the comfort of your own Mac.

Timbuktu $92

Best Presentation Product, Best Development Tool and Best Utility

Symantec Products, MORE 3.0, THINK Pascal 3.0 and Norton Utilities

Symantec has three winners this year. The first was MORE, which is the best presentation-software package around as well as one of the premier outliners. THINK Pascal which has the most advanced and comfortable development environment on the Mac, is the benchmark for today's developmental environments. And Norton Utilities which has redefined the state of the art of data-recovery software. It speed ups disk-related work with an optimizer and a standard file-dialog box extender with high-speed file-finding capability. It can resurrect data from sick disks with its intelligent recovery tools.

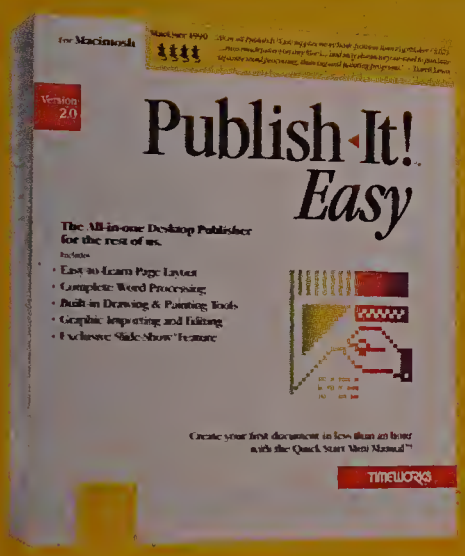
More 3.0 .....$259
Think Pascal $160
Norton Utilities $83

Best CAD Software

Graphsoft MiniCad + 3.0

MiniCad+ is a product that integrates a spreadsheet and a relational database into a drawing so you can keep track of costs as the design evolves. Database information linked to a particular object stays with that object even when it is cut and pasted into another drawing. MiniCad+ also has a built-in programming language and a "smart cursor" to aid in the finer points of drafting.

MiniCad+ 3.0 .....$585



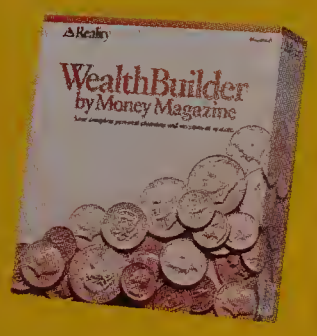
Best Page Design Software

TimeWorks Publish It! Easy 2.0

Publish It! Easy integrates page layout, word processing (with spelling checker and thesaurus) and drawing and painting, so even beginners can produce attractive documents. It includes most of the features of Publish-It, but adds many useful new functions. Dynamic Text Flow reformats text when you adjust the size of text frames. Zoomable palettes disappear when you need screen space. With Multiple Undo Levels you can remove changes five steps back. Editable Thumbnails let you see and edit the entire page.

Publish it Easy $135

Best Financial Management Package



Reality Technologies WealthBuilder

WealthBuilder can help you plan for the future, whether it's retirement, college education, or a big vacation. You create 'what if?' screnarious based on different economic and personal assumptions, and WealthBuilder tells you how much you need to save. It can also suggest what portion of your savings should be in stocks, bonds, or pork bellies. A database of stocks and mutual funds contains information on ratings and performance for the past ten years, the information is updated quarterly.

WealthBuilder $144

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Timeslips Corp.
Timeslips III 2.0 ..... 194.

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Established 1986

One source for all your needs

Quark XPress 3.0

XPress 3.0 boasts a more intuitive user interface, many new features, plus redesigned and reorganized documentation. New measurement and page palettes provide the user with interactive onscreen access. A library stores frequently used items, and a pasteboard provides a work area next to each page. You can group text and graphics as single elements, and rotate them a full 360 degrees in 0.001 degree increments Color trapping ensures precise color printing. XPress was also awarded Honorable Mention in both Best Color PrePress and Best Page-Design catagories in the MacUser Magazine Eddy Awards.

XPress 3.0 .....$518

Dantz Retrospect 1.2

With Retrospect, you can remove seldom-needed files to permanent storage, and free up space on your hard disk. It works with almost any media, from floppies to rewritable optical discs. Retrospect maintains a catalog on your hard disk so you always know where to look for your archives or back up files.

Retrospect 1.2 w/10 Pk Remote $264
Retrospect 1.2 .....$143
Retrospect 10 Pk Remote $149

Education

Addison Wesley
Inside Macintosh, Vol. 1-5ea 18.
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Mac Ski ..... 37.
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Storm Technologies PicturePress

PicturePress compresses and decompresses 24-bit color images 10 to 60 times, using the emerging Joint Photographic Experts Group international still image compression standard. PicturePress operates alone or can be accelerated 20 to 50 times by the PicturePress Accelerator Card, a programmable 60 MIPS image processing NuBus Card.

PicturePress $120

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Design Your Own Home Architecture, Interiors & Landscape ..... ea. 60.

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Zedcor DeskPaint 3.03

DeskPaint is a 98K DA that works as well with black & white images on a Macintosh Plus or Classic as does with color images on a IIsi or IIfx (even in 24-bit color). It reads and writes PICT, TIFF, and MacPaint files It does smoothing, auto-trace, graduated fills, multiple windows, and a lot more. DeskDraw is a DA comparable to MacDraw. Some of it's features include hairlines, rotated text and arrows. It reads and writes PICT files compatible with SuperPaint, MacDraw II and Canvas

DeskPaint 3.03 ....$113

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The MacZone Established 1986

Business & Presentation

ACIUS
File Force 1.0 ..... 248.
4th Dimension 2.1 ..... 488.
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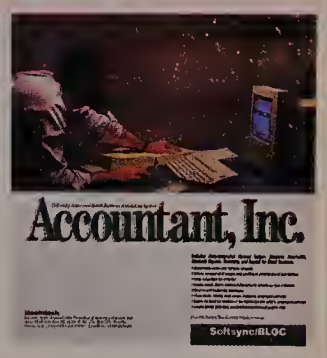
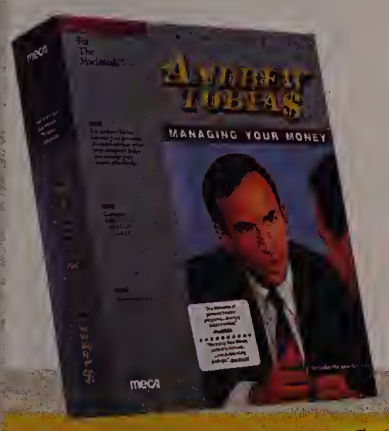


Softsync Accountant, Inc. Professional

Accountant, Inc. is a business accounting package that integrates General Ledger, Accounts, Payable, Accounts Receivable, Inventory, Payroll, Job Costing, Project Management and complete financial analysis. Businesses can tract an unlimited number of customers, vendors, inventory items and General Ledger accounts. The program creates invoices, purchase orders, statements, credit memos and job quotes.Account, Inc. allsows you to quickly and easily create and print your own forms, perform in-depth vendor and cuswtomer analysis, export reports to word processors, databases and spreadsheets and handle tax-related issues.

Accountant, Inc. Pro 2.0 ..... $335



Meca Software, Inc. Managing Your Money 4.0

Andrew Tobias' Managing Your Money is personal financial software that in includes powerful financial "chapters" that provide everything from basic budget and checkbook management to life insurance and tax planning, even complex portfolio management. These integrated chapters allow transactions made in one part of the program to be automatically recorded in the other chapters.

Managing Your Money $134

Prescience
Expressionist 2.03 ..... 78.
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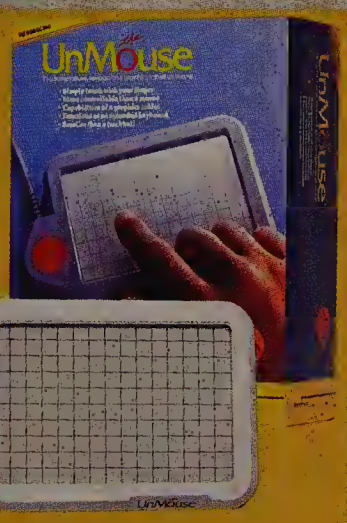

Microtouch Systems UnMouse

The UnMouse does everything a mouse can – only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface; to make a selection, merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you instantly have a Power Keypad with 16 keys available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs admirably as a graphics tablet.

UnMouse $180

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12" x 12" ..... 384.
12" x 17" ..... 624.

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Microtek - Scanners
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Olduvai Software
Read-It! Personal 2.1 ..... Call
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The Complete PC
Half Page Scanner/400 ..... 294.
Full Page Scanner ..... 755.

Thunderware
Lightning Scan 400 ..... 384.
ThunderScan Plus ..... 198.

Total Systems Gemini Accelerator Boards

Put the power of the latest Macs onto your Mac SE, Plus, 512 or original 128 Mac, with Total Systems' Gemini 68030 Accelerator cards. Gemini pumps up your Mac's humble 8 Mhz 6800 to IIci-shattering 20, 33, 40 or 50 Mhz. The MacZone also carries other Total Systems' accelerators, including Voyager cards for your MacII.

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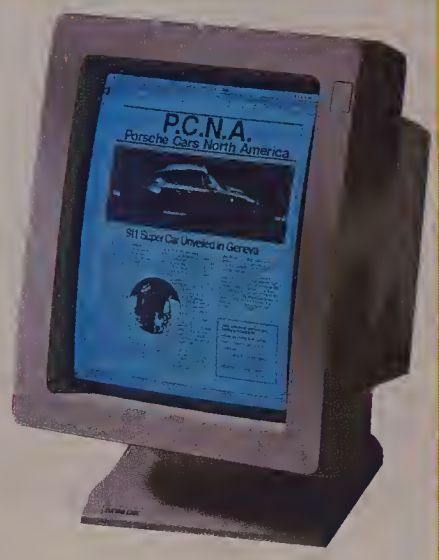

You can now eliminate all the scrolling, scrunching and squinting of small screen Macintosh computing. Word processing, financial analysis and graphics have never looked as good as they do on this full screen viewing area. The monitor can display an entire 8-1/2 x 11 inches of screen with a flicker-free refresh rate of 75 Hertz and a high resolution of 640 by 870 pixels

15" Monitor $579

E-Machine T-16 Color Display

Spread out with almost twice the display area of the standard 13" color monitor. View your work exactly as it will be printed at actual size - 72 dpi. Save almost one half the cost of a 19" color monitor. Get the sharpest, clearest color display at any price. The T16 has excellent colors, linearity, and sharpness, and it sells for a lot less than its larger cousins. The T16 is an excellent choice for CAD/CAM or color graphics. **Retail $2995.**

T16 Color Monitor $2275

Sigma L-View Multi-Mode Monitor

An ergonomic monitor design offers user-oriented details like a tilt/swivel base and paper white phosphor. L-View's Low-Emission design meets guidelines for electromagnetic field emissions established by the Swedish National Board for Measurement and Testing. L-View includes video card, 19" monitor, control panel software, and user's guide.

Multi-Mode Monitor $1475

Mega Graphics Rival B & W Monitor

The officially acclaimed Mega Graphlcs Rival is now available for all Macintosh models. It gives you the most crisp, most clear, and brightest image in the business, with true "What you see is what you get'./ Because the 19" screen display two facing pages, it is ideal for use in desktop publishing, layout and word processing. The wide expanse of workspace is an enormous benefit when using CAD and spread sheet applications.

Rival 2001 .....$1199

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Micron - 8 Bit Color Cards

Resolution 640 x 480
Mac II or SE/30 ..... 345.

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Mac II or SE/30 ..... 585.

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System Mac II & SE/30 .... 1692.

ColorBoards
208 (II, IIx, IIcx, IIci) ..... 290.
264 (SE/30 - 13") ..... 525.
264 (Mac II - 13") 435
364 (Mac II - 13") ..... 955.

RasterOps
Multi Media
364 w/AudioMedia ..... 1525.
364 w/Director ..... 1295.

Sigma Designs
L-View Multi Mode
SE/30 or Mac II ..... 1475.
Page View
SE, SE/30 or MacII ..... 850.
Silver View for Mac II ..... 1850.
Color Max 24 ..... 4350.

Sony - Color Multiscan
14" 1304 HG Color ..... 825.

New Full Page Plus and Classic Monitors

Princeton full page display with Lapis video card for the Macintosh Plus and Classic. Apple phosphor and 75Hz Vertical Refresh. Includes $25 Rebate coupon for dealer installation.

Classic $649
Plus $679

Lapis

** Special shipping charges apply for monitors. Call for details. All returned monitors are sujbect to a 15% restocking fee.*

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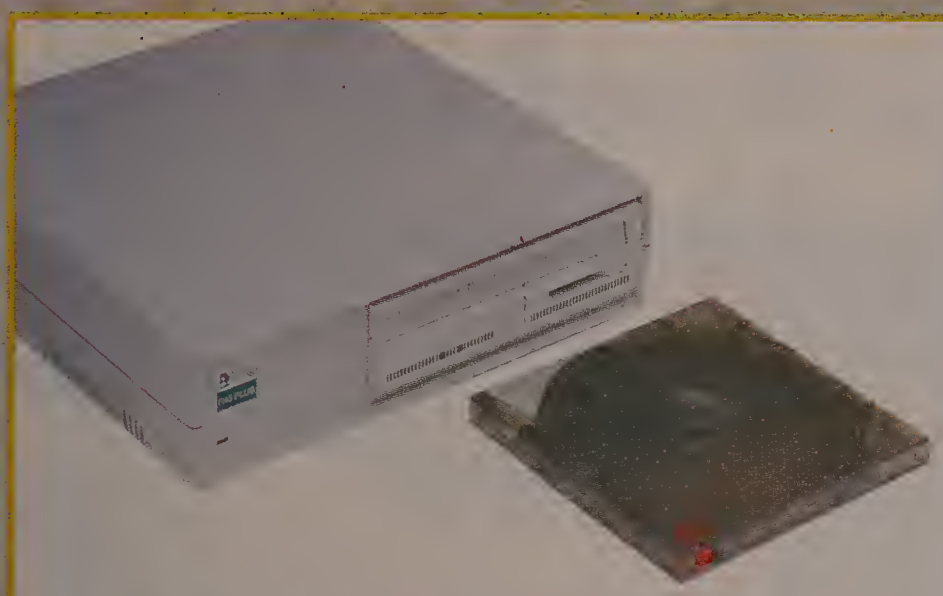
Data storage from MacZone

that you can always depend on

The MacZone Established 1986



Rodime R45 PLUS Removable Hard Drive

The R45 PLUS has a 44 megabyte removable capacity and a fully embedded SCSI controller. Because the cartridge is removable the R45 PLUS virtually offers unlimited storage. The half-height 5.25 inch drive has a average access time of 20 milliseconds and a disk transfer rate of 10 megabits per second. The transportable, rugged cartridge media assures user security and portability. The R45 PLUS offers users an expandable systems with limitless applications.

R45 PLUS Removable Hard Drive $589

LaCie Tsunami

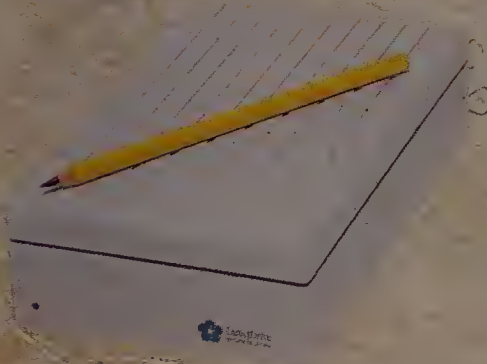
Tsunami drives come initialized with SilverLinning, the standard of hard disk utility software, and SilverPlatter. Apple's system, five megabytes of public domain software and Norton Utilities are also included on the drive. Ask you MacAdvisor about the new 2 plus warranty on Tsunami drives.

40 Mb Drive $550

Cutting Edge 20 Mb Drive

Cutting Edge hard drives represent the best value in Macintosh storage. Major enhancements include quieter fan, two power outlets and added surge protection.

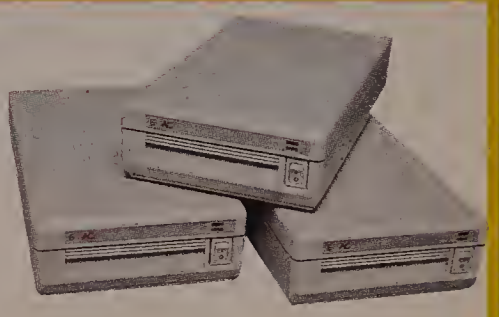
20 Mb Drive $299



Jasmine 40 mb Portable Hard Drive

Jasmine Technologies has consistently finished first in the MacUser Lab's Buyers Guide and we've been praised in every major Macintosh publication for the quality of our drives and for the ease of use in DriveWare, our custom drive utility. DriveWare, provides the best SCSI partitioning, password protection, error correction, diagnostic and help software. And included with this drive is two award-winning utility software packages, Sum II and Virex plus over 10 megabytes of Shareware and Freeware programs.

40 mb Hard Drive $299



EMAC Impact Drive

The EMAC Impact hard drives pack all the power and convenience of a full-sized drive into a compact chassis. Now all your files and applications can be stored in one easily accessed location. Impact drives come in three capacities and are built with precision-engineered drive mechanisms for whisper-quiet, high-speed operation.

80 mb Drive $805

PLI Infinity 40 Turbo Removable Hard Drive

The Infinity 40 Turbo uses PLI's turbocharged driver software to attain a 20ms access time, and with the TurboCache disk accelerator software and TurboBoost, you can achieve near zero effective average access times. This removable 45MB drive gives you infinite storage potential with removable cartridges. Each one holds 44MB and costs only slightly more per megabyte than floppy disks.

40 Turbo Removable $750

Data Storage Devices

CD Technology
Toshiba Mechanisms
Porta Drive CD ROM ..... 648.

Cutting Edge
Seagate Mechanisms
30MB External ..... 379.
45MB External ..... 439.
60MB External ..... 469.
80MB External ..... 529.

Dayna Communications
DOS Mounter ..... 53.

EMAC - Impact
20MB External ..... 385.
40MB External ..... 520.
80MB External ..... 750.
170MB External ..... 1,305.

Jasmine - Portable
40MB ..... 299.

Microtech
Seagate Mechanisms
100MB External ..... 625.
While supplies last

La Cie - Tsunami
Quantum Mechanisms
40MB External ..... 550.
50MB PLS External ..... 630.

La Cie - Tsunami
Quantum Mechanisms
80MB External ..... 720.
105MB External ..... 765.
105MB PLS External ..... 815.
170MB External ..... 1,115.
210MB External ..... 1,210.

NEC
CDR-35 Port. CD ROM ..... 458.
CD-ROM-35 Battery Pack .... 58.

PLI - Turbos
250MB External ..... 1,725.
300MB External ..... 1,975.
600MB External ..... 2,850.
600MB Optical Drive ..... 3,794.
600MB Optical Cartridge ... 235.
CD ROM Drive ..... 875.
SyQuest Removable
Infinity Twin ..... 1,475.
Carrying Case ..... 60.

Quantum External
40MB ..... 428.
80MB ..... 598.
105MB ..... 679.
120MB ..... 768.
170MB ..... 928.

Quantum Internal
40MB ..... 349.
80MB ..... 569.
105MB ..... 599.
120MB ..... 768.
170MB ..... 869.

Rodime
SyQuest Mechanism
45MB Removable ..... 659.
Rodime Plus
20MB External ..... 328.
45MB External ..... 449.
Rodime Cobra Series - Internal
45MB Internal ..... 410.
70MB Internal ..... 675.
100MB Internal ..... 735.
210MB Internal ..... 1,165.
330MB Internal ..... 1,725.
Rodime Cobra Series - External
45MB External ..... 550.
70MB External ..... 795.
100MB External ..... 860.
210 MB ..... 1,295.
330MB External ..... 1,895.
650MB External ..... 2,775.

SyQuest
44MB Cartridge ..... 74.

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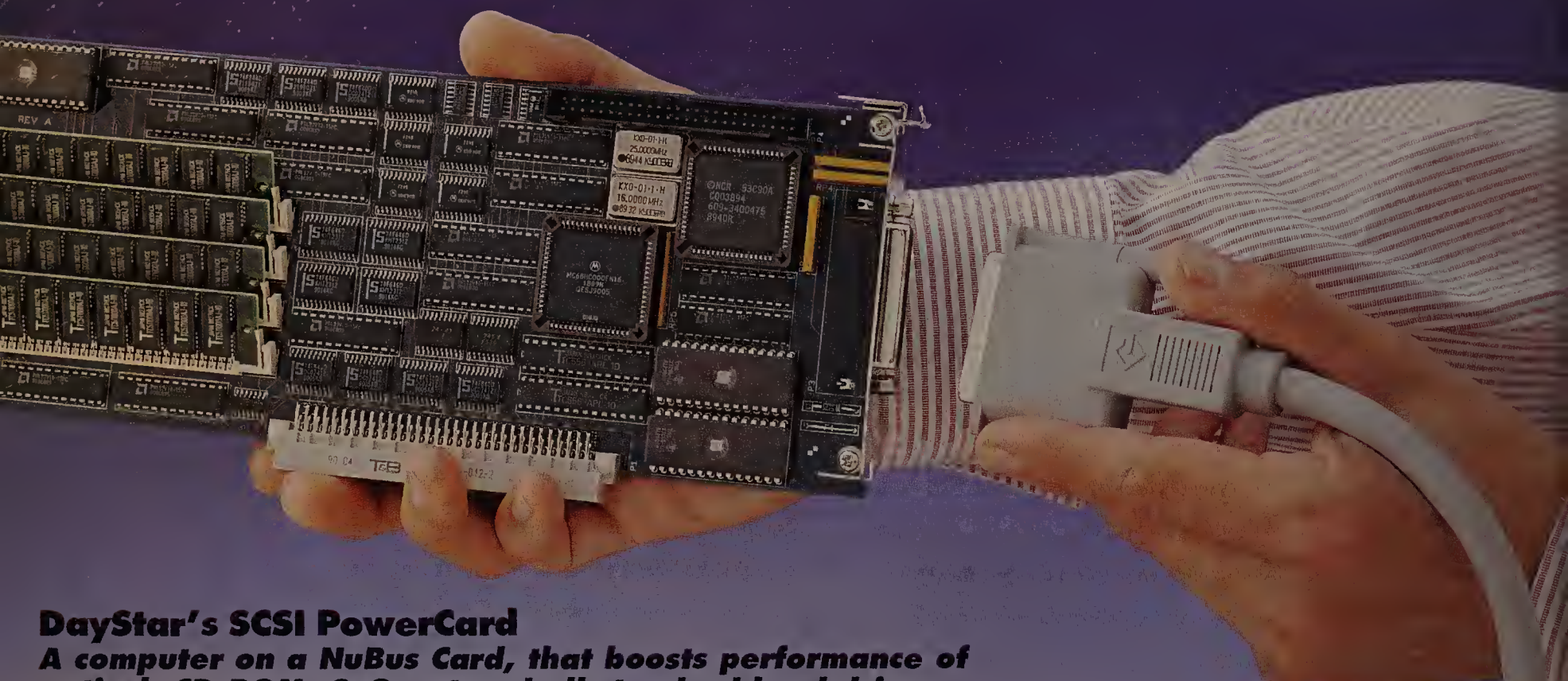
Plug this in... Supercharge all of your hard drives.



DayStar's SCSI PowerCard
A computer on a NuBus Card, that boosts performance of optical, CD-ROM, SyQuest and all standard hard drives.

Hard drives are a major performance bottleneck – even Mac IIfx users are suffering. DayStar's new SCSI PowerCard breaks the bottleneck by supercharging SCSI hard drive performance. The SCSI PowerCard™ gives all drives the ability to perform like superfast RAM disks – getting data to and from your applications at lightning fast speeds.

World's Fastest Performance

The SCSI PowerCard works with all standard hard drives, including optical, SyQuest™ and CD-ROM. It's so powerful that even slow optical drives perform disk intensive tasks at double the speed of a WrenRunner II™ – the worlds fastest hard drive. This is true whether you plug the SCSI PowerCard into a Mac II or IIfx.

A Computer On A NuBus Card

The SCSI PowerCard is much more than "just a fast SCSI chip"– its a complete computer with processor, memory and special cache software. It has the ability to expertly cache megabytes of hard drive data in its large RAM buffer and instantly provide just what your application calls for.

Applications Run Faster

The SCSI PowerCard boosts productivity within all applications. DTP and pre-press users can scroll, paint and modify images two to three times faster. Software developers can compile application code in half the time. Rendering is twice as fast. It even triples the speed of database searches and sorts. Or, plug it into a file server – multi-user applications will run up to four times faster.

Easy, Quick Installation

Its as simple as plugging in a NuBus card. We give you an illustrated manual that takes you through step-by-step. Special software makes operation automatic, or you can custom tailor it to meet your needs. Have a problem? Call our tech support department. They know their stuff and want to help.

Turn To DayStar Digital

When it comes to performance, we are the upgrade company. Things have never been easier.

Call for these DayStar products from MacZone

PowerCache 030 IIci		*PowerCard 030*			
40Mhz w/o FPU	$995.	25Mhz II, IIx IIcx	1,115.	SCSI Accelerator - w/o SIMMS	
40Mhz w/FPU	1225.	33Mhz II, IIx	1,495.	SCSI PowerCard	1,025.
50Mhz w/o FPU	1750.	40Mhz II, IIx	1,650.	RAM Expansion - w/o SIMMS	
50Mhz w/FPU	2050.	50Mhz II, IIx	2,245.	RAM PowerCard	625.
Fast Cache IIci	280.				

DAYSTAR DIGITAL

The Mac Zone Established 1986

Circle 70 on reader service card

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1-800-248-0800

Grumbles about Ehman and Crate

As long as I'm calling companies to task for service problems, here's a quick note about Ehman Engineering. The company faced a rash of complaints about service last fall, many of them posted in its America Online forum. (My favorite exchange involved an irate customer and company head Michael Ehman, who suggested the customer was acting like "a horse's ass." But according to Ehman, that wasn't from him, but from an employee no longer with the company.) The company concedes there have been problems but seems to be working on it. "I think what happened is that we went through rapid growth and all of a sudden there was a huge base of users. Our tech support got overwhelmed," said Michael Ehman. "The bottom line is that we sell a huge amount of stuff. When you do that, you're going to have problems."

One planned improvement is a new computer system with bar-coding capacity to keep track of all the drives. Ehman has hired a consultant to work on problems. And the company hopes to do more remote troubleshooting.

In other news, Data Storage Development, the storage company that bought the assets of Crate Technology last year and is headed by Crate's former president, Chris Lemoine, has reneged on its promise to honor Crate warranties.

Landmark VDT Legislation

The nation's most comprehensive ordinance governing the use of video display terminals (VDTs) was approved by the city of San Francisco in December. The regulations cover workers who use VDTs four hours or more per day in businesses with 15 or more employees (with some minor exceptions).

The main provisions of the ordinance make employers responsible for providing workers with adjustable chairs and adjustable monitors. Glare screens, wrist rests, footrests, and document holders will be available to workers upon request. Alternative work or rest breaks of 15 minutes are mandated after every two hours of keyboard work. And employers must provide information and training about the health and safety concerns associated with VDT use.

This landmark ordinance was some four years in the making and faced stiff opposition initially from the business community. The VDT Coalition, which is made up of several union locals and a number of injured VDT operators not represented by labor, spearheaded the effort to pass the bill as the local Chamber of Commerce worked to defeat it. But a spirit of compromise reigned, and the Board of Supervisors adopted a three-phase schedule for implementation.

New workstation equipment purchased 12 months or more after the bill's approval must meet the new standards. Within 30 months, companies must spend up to $250 per workstation upgrading existing equipment to meet the guidelines. If more than $250 worth of improvements are required, companies have an additional 18 months in which to bring their VDT workstations into full compliance.

Originally the ordinance gave employers only two years to meet the VDT standards. "Basically the business community was saying to us that the normal computer life span is four years," said Barbara Kellogg, co-chair of the VDT Coalition and a representative of the Service Employees International Union Local 790. "Many of the companies were in the process of just upgrading their equipment." Businesses argued that if they had only two years to meet the standards, they would simply upgrade existing workstation equipment, but given four years they would buy new (and presumably more ergonomic) workstation products.

One provision dropped from the original bill mandated a 5-foot distance between workstations to protect VDT operators from electromagnetic emissions. "The whole issue was dropped for legal reasons," said Kellogg. "Our attorneys told us that existing documentation and existing language was not defensible in court." Instead, the advisory committee established by the ordinance is supposed to report back to the Board of Supervisors on the methods to protect VDT users and other workers from possible emissions, as well as the impact of VDT use

(continues)

Circle 381 on reader service card.

Circle 228 on reader service card.

SERVICE HERO

Rosemary E. Britell of New Hartford, New York, writes that she was concerned about having her hard drive repaired during the Christmas rush. But Scott Chase of MacConnection assured her on December 17 that the company would repair and reship her hard drive the same day it was received. Sure enough, "I received my drive back on Wednesday, December 19th. . . . There was no charge to me, except for my end of the mailing, since the drive was under manufacturer's warranty."

on pregnancy and other health issues.

Even though the San Francisco legislation has passed, it may still be overruled. Similar legislation in Suffolk County, New York, was overturned by a court, and one of the supervisors who voted against the San Francisco bill is threatening a legal challenge. There's also the possibility that business interests may push for weak state legislation that would take precedence over San Francisco's VDT law. "I think the struggle at the state level will be over to what extent the state legislation can have teeth," said Kellogg. "So far [VDT] bills have been extremely watered down, and even then they've been vetoed."

The Los Angeles City Council is considering a similar ordinance, and officials from several states have also expressed interest in the bill. Contact San Francisco Board of Supervisors' office at 415/554-5184 for copies of ordinance number 405-90. Ⓜ

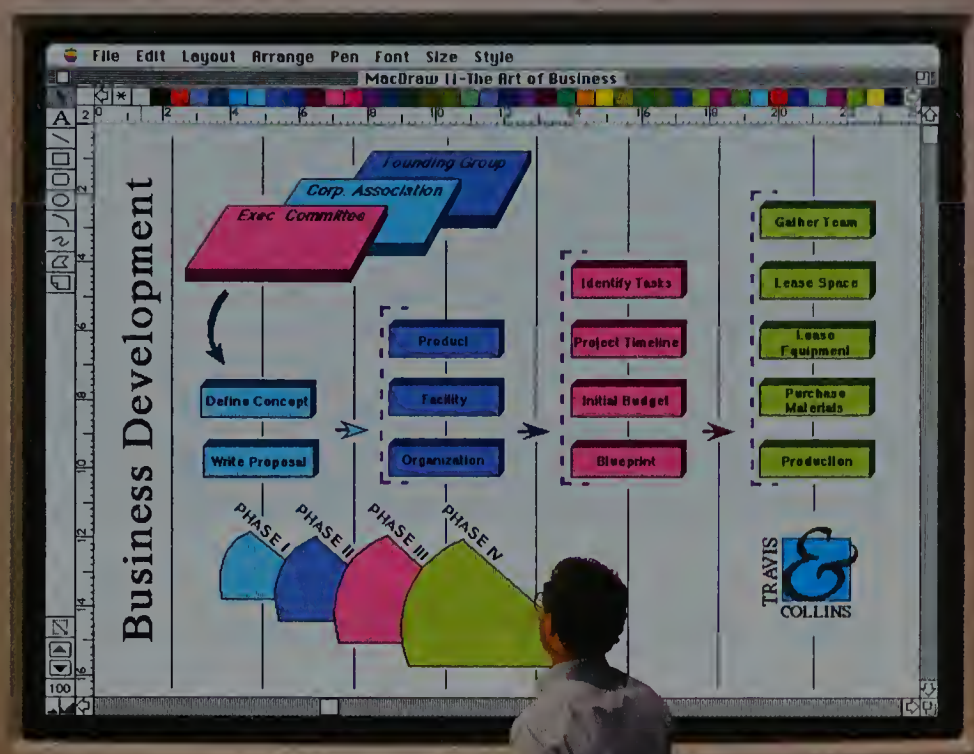
(Research assistance by Carolyn Bickford.)

. . . . . .

Send nominees for sainthood to Service Heroes, Macworld, *501 Second St., San Francisco, CA 94107 or via AppleLink (Macworld1) or America Online (Branscum). Conversely, drop* Conspicuous Consumer *a line if a company is ignoring you.*

Application

MacWrite II
FileMaker Pro
MacDraw II
HyperCard 2.0
MacProject II 2.1
Claris CAD 2.0
SmartForm Series
MacPaint 2.0



Story

The art of business.

MacDraw II

Have you ever noticed the way your colleagues use graphics?

How they seem to make their reports and presentations come alive?

Chances are, they're using MacDraw® II software, the most popular drawing tool for the Macintosh.

With MacDraw II you can illustrate reports, design products, publish flyers, and present proposals in a way that makes people sit up and take notice. Even if you have never used a drawing tool before.

What's more, MacDraw II is advanced enough to keep you satisfied for years to come. Its power and depth have made it a standard for companies who need a tool that beginners can start with and expert designers can stay with.

So as *you* find more things to do with graphics, MacDraw II gives you plenty of power to draw from.

And don't be surprised if you advance quickly, either. MacDraw II works like you think. So the feel is totally natural.

But why not see for yourself. Just ask a colleague to show you MacDraw II. Or stop by an authorized Claris dealer to find out how effective you can be at the art of business.

Special Offer

Free Upgrade.

Buy MacDraw II now and get a free upgrade this spring to MacDraw Pro. Plus, buy now, join our 500,000 other users, and you'll get free MacPaint and free clip art along with MacDraw II. See your Claris dealer today.

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Complete Ready-to-Run Macintosh Systems

Macintosh Classic 50Mb System

- Macintosh Classic w/Apple SuperDrive, Keyboard, Mouse, & 4 Mbs of RAM
- Microtech 50 Mb Internal Hard Drive
- HyperCard and MultiFinder
- Virex Anti-virus Software
- Adobe Type Manager
- 6 Outlet Surge Protector
- 10 High Density 3.5" Diskettes
- Diskette Storage Case
- Mouse Pad

Ask for Package #9102
CDA $1,599 or $45.[26]/month**
Macintosh Classic system above with:
100 Mb Hard Drive $1,799

Mac Classic Hard Drive / Memory Bundles
Europa 20 Mb Internal HD w/3 Mbs RAM .. $479
Europa 50 Mb Internal HD w/3 Mbs RAM .. $579
Europa 100 Mb Internal HD w/3 Mbs RAM $809

***New Low Prices!* Fast 80ns SIMM Modules**
2 Megabyte Upgrade (Plus/SE) $118
4 Megabyte Upgrade (SE/30/Mac II) $220
4 Megabyte Upgrade (IIfx) $299
16 Megabyte Upgrade (68030) $1099
1 Megabyte Upgrade (Mac Classic) $109
3 Megabyte Upgrade (Mac Classic) $179

Outbound w/o ROM, 40Mb HD, 2Mbs RAM (use your Plus, SE, or Classic's ROM) $2995
Outbound/Classic Bundle w/40Mb HD, 2Mbs RAM, and the Macintosh Classic CPU $3595

When you purchase your Macintosh from CDA you will receive the following:

- Knowledgeable sales assistance
- Top quality components
- All systems are upgraded, tested & preformatted before shipping
- Unlimited technical support
- 30 Day Money Back Guarantee
- One Year Performance Guarantee

Macintosh LC 40Mb System

- Macintosh LC w/Apple 40Mb HD, Apple SuperDrive, 2 Mbs of RAM, Microphone, Keyboard and Mouse
- Apple 12" Color Monitor
- HyperCard and MultiFinder
- Virex Anti-virus Software
- Adobe Type Manager
- 6 Outlet Surge Protector
- Mouse Pad
- 10 High Density 3.5" Diskettes
- Diskette Storage Case

Ask for Package #9150
CDA $2,569 or $67.[44]/month**

Macintosh IIsi 40Mb System

- Mac IIsi w/Apple 40Mb HD, Apple SuperDrive, 2 Mbs RAM, Microphone
- MacPro Plus Keyboard w/Tempo II
- Magnavox 14" Color RGB Monitor
- HyperCard and MultiFinder
- Virex Anti-virus Software
- Adobe Type Manager
- 6 Outlet Surge Protector
- Mouse Pad
- 10 High Density 3.5" Diskettes
- Diskette Storage Case

Ask for Package #9110
CDA $3,699 or $87.[75]/month**
**Based on 60 month FMV lease

Macintosh IIci Power System

- Macintosh IIci w/built-in Video Card, Apple SuperDrive, 4 Mbs of RAM
- Microtech Nova 105 Mb Internal Hard Drive w/5 Year Warranty
- Magnavox 14" Color RGB Monitor
- MacPro Plus Keyboard w/Tempo II
- HyperCard & MultiFinder
- Virex Anti-virus Software
- Adobe Type Manager Software
- Norton Utilities, Total Recall and Loads of Free Shareware
- 6 Outlet Surge Protector
- Mouse Pad
- 10 High Density 3.5" Diskettes
- Diskette Storage Case

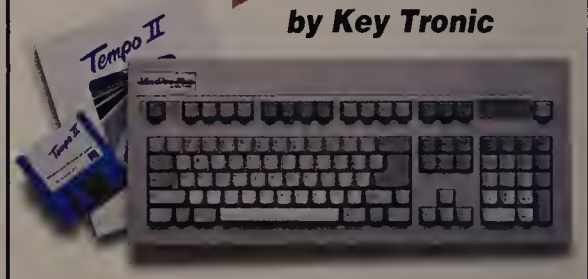
Ask for Package #9107
CDA $5,869 or $134.[61]/mo.**

▶ The Rival 19" Monochrome Display *by MegaGraphics (see photo above)*

MacWorld Magazine rated the Rival the top performing WYSIWYG big screen — outranking dual-page displays costing much more.

BONUS! When you purchase a MegaGraphics monitor you'll receive a Coupon Book with over $4,400 savings towards a variety of Mac products!
Rival 19" Monochrome w/video card $1169
Rival 19" Gray Scale (Mac II) w/video card $1729
Rival 19" Gray Scale (SE/30) w/video card $1789

▶ The MacPro Plus *by Key Tronic*



No matter which Mac you use, old or new, the MacPro Plus keyboard gives you the ability to get you through your work faster and easier. The 105-key layout is similar to the Apple Extended Keyboard, but with more features. Also included is a free copy of Tempo II Software ($99 value) $119

All prices subject to change. Apple/Macintosh are registered trademarks of Apple Computer Inc. CDA is not an authorized Apple dealer. Product names are registered trademarks of their respective companies.

Microtech Hard Drives

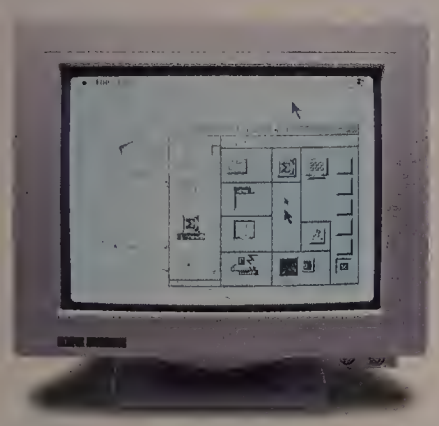
The Nova series hard drives feature the reliable Quantum mechanism, a 5 year warranty and come complete with software & bracket.

Microtech Nova 40 Mb Internal 19ms $449
Microtech Nova 80 Mb Internal 19ms $619
Microtech Nova 105 Mb Internal 19ms $679
Microtech Nova 120 Mb Internal 19ms $819
Microtech Nova 170 Mb Internal 19ms $999
Microtech Europa 20 Mb External $379
Microtech Europa 40 Mb External $409
Microtech Europa 80 Mb External $599
Microtech Europa 100 Mb External $729
Microtech Athena 50 Mb External $569
Microtech Athena 100 Mb External $849

DataPak Cartridge Drives

All DataPak drives come with DiskDoubler software, a 45Mb cartridge & 2 year warranty.

DataPak (SE footprint) $729
DataPak Duet $1489
DataPak II (Mac II, IIx, IIfx footprint) $859
DataPak II Duet $1499
DataPak IIcx (Mac IIcx,/ci footprint) $799



Sigma Designs L*View Multi-Mode

Now you can truly zoom in and out of your work. Zoom out to see 70% more of your job on screen. Zoom in to see a 200% close-up. No matter which software program you're working in you have the power to see your work in 6 sizes and resolutions. (for Mac II-19")

Sigma L*View MultiMode $1379
Sigma PageView GS (IIci/si) $689

Monitors & Video Cards

Magnavox Mac Color 14" RGB $459
NEC MacSync 14" Color HC $499
Apple High Resolution 13" RGB $799
E-Machines ColorPg T-16 w/video card $2149
E-Machines TXsi $3089
Radius Pivot IIsi/IIci $1199
Ikegami CT20 20" Trintron w/8-bit card $2799
RasterOps 8LC System $2759
RasterOps ColorBoard 264 (Mac II) $539
RasterOps ColorBoard 364 (Mac II) $949
Micron 8-bit Video Card (Mac II, SE/30) $349

Input / Output Devices

Kensington Turbo Mouse ADB $109
Kurta Tablet (8 1/2" x 11") ADB $369
Wacom Graphics Tablets ..... Please Call
QuickImage 24 Desktop Video Card $699

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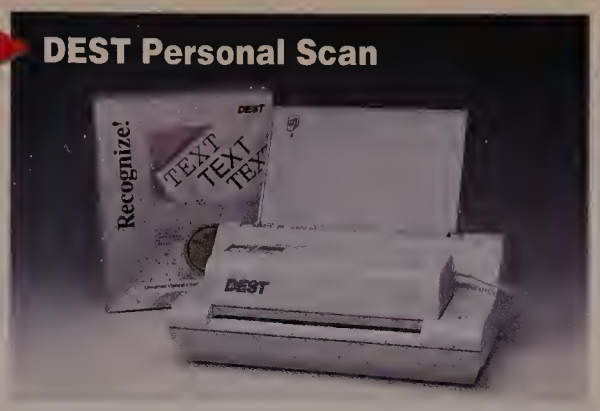
*CDA will ship your order *free* via Federal Express® Economy Two Day Service. This applies to all stock items under 15 lbs. (orders over $100) shipping within the contiguous US.

DEST Personal Scan



The DEST Personal Scan makes OCR scanning a breeze. This is the first scanner to combine full-page, one pass, hand-held scanning with ten-page capacity sheetfed scanning. Included is a free copy of Recognize! OCR software which uses only 1 Mb of memory ($500 value) $689

Scanners

DEST Scan 3000 ..... $1159
Logitech ScanMan 32 ..... $319
Thunderware ThunderScan $169
Microtek MS-II w/Omnitype OCR $839
Microtek MSF 300GS w/SCSI $1339
Microtek 300ZS w/Image & Color Studio ... $1895
XRS 3C Transparency/Slide Upgrade $1799

Printers

LaserWriter IINT w/cable & toner $3395
Personal LaserWriter NT w/cable & toner ... $2475
TI microLaser PS 35 w/cable & toner $1999
HP DeskWriter w/cable $759
NEC SilentWriter 2 Model 90 w/cable $1845
Kodak Diconix M150 + w/ATM & cable $529
QMS PS-810 w/cable & toner $2995
QMS PS-410 w/cable & toner $2199

Connectivity

Farallon PhoneNET StarController 300 ..... $859
Farallon PhoneNET StarController EN $1599
Farallon PhoneNET Connector (DIN-8) $29
Farallon PhoneNET Repeater $315
Farallon Timbuktu 3.1 ..... $95
Farallon Timbuktu/Remote 1.01 ..... $123
Dayna Dos Mounter 2.0 ..... $52
DaynaTalk PC $219
DaynaTalk Micro Channel $289
DaynaTalk Speed Guard Collision Filter $52

EtherNet Products from *Dayna*

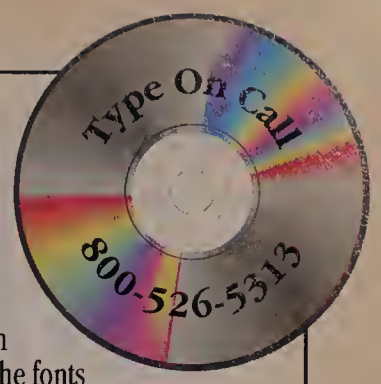
DaynaPORT network interface cards let you connect your Mac to thick and thin cable and twisted pair Ethernet based AppleTalk network systems. With the DaynaPORT cards, you can share Ethernet system resources such as printer, modems, electronic mail, file servers and file transfering with other network hosts.

DaynaPORT E/30, E/SE, or E/II $289

EtherPrint is an easy to use, easy to afford way to connect your Ethernet network to any LocalTalk compatible printer. $349

NEW!

Type On Call from Adobe



Now you can get the entire Adobe Type Library on a Macintosh formatted CD-ROM. The fonts arrive locked; you can "unlock" as many as you wish to instantly obtain your new typeface. Simply call CDA to purchase and receive the access code necessary. Initial purchase includes the CD-ROM disc, Adobe Type Manager (including the base 13 fonts), bitmaps to all of the fonts included on the disc, and access to 2 typeface packages to be selected from a list of eight. Or purchase all eight and save over $200!

Type On Call w/two fonts $59
Type On Call w/eight fonts $229

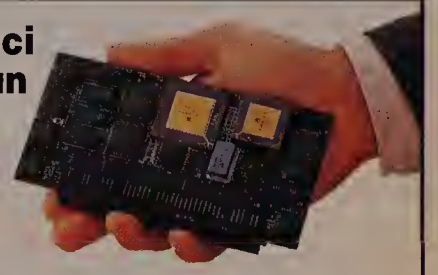
Special Offer!

Get Type On Call *free* when you purchase a CD-ROM Porta-Drive by CD Technologies $689

Modems

DoveFax Desktop Modem $289
AE DataLink Express 2400 External $169
AE DataLink Express w/MNP-5 External $199
AE DataLink Mac 2400 Internal (Mac II) $199
Zoom 2400 Baud w/cable & software $129
Zoom V.42 bis w/cable & software $199

Your IIci Will Run faster than a IIfx!



The DayStar PowerCache IIci Card will accelerate your IIci to IIfx speeds and beyond. It installs easily into your cache card connector slot. If you already have a cache card, CDA is now offering a Trade-in Rebate Program for up to $1,000 back — pricing below reflects the maximum rebate. Call for details!

PowerCache IIci 40 MHz $799
PowerCache IIci 50 MHz $1089

DayStar Fast Cache IIci $279
PowerCard 030 40 MHz (II, IIx, IIcx) $1399
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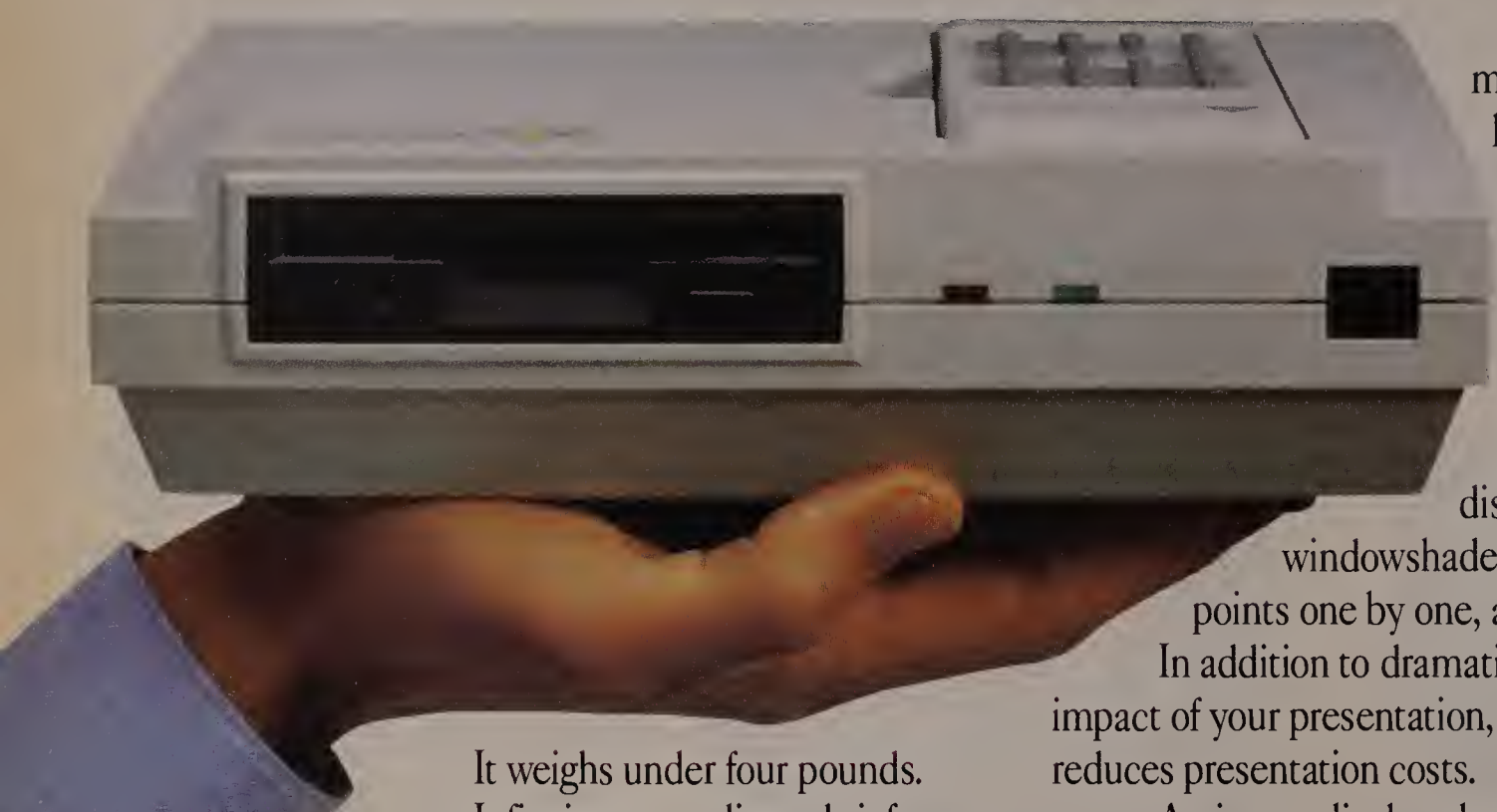

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MACWORLD NEWS

by Dan Littman and Tom Moran

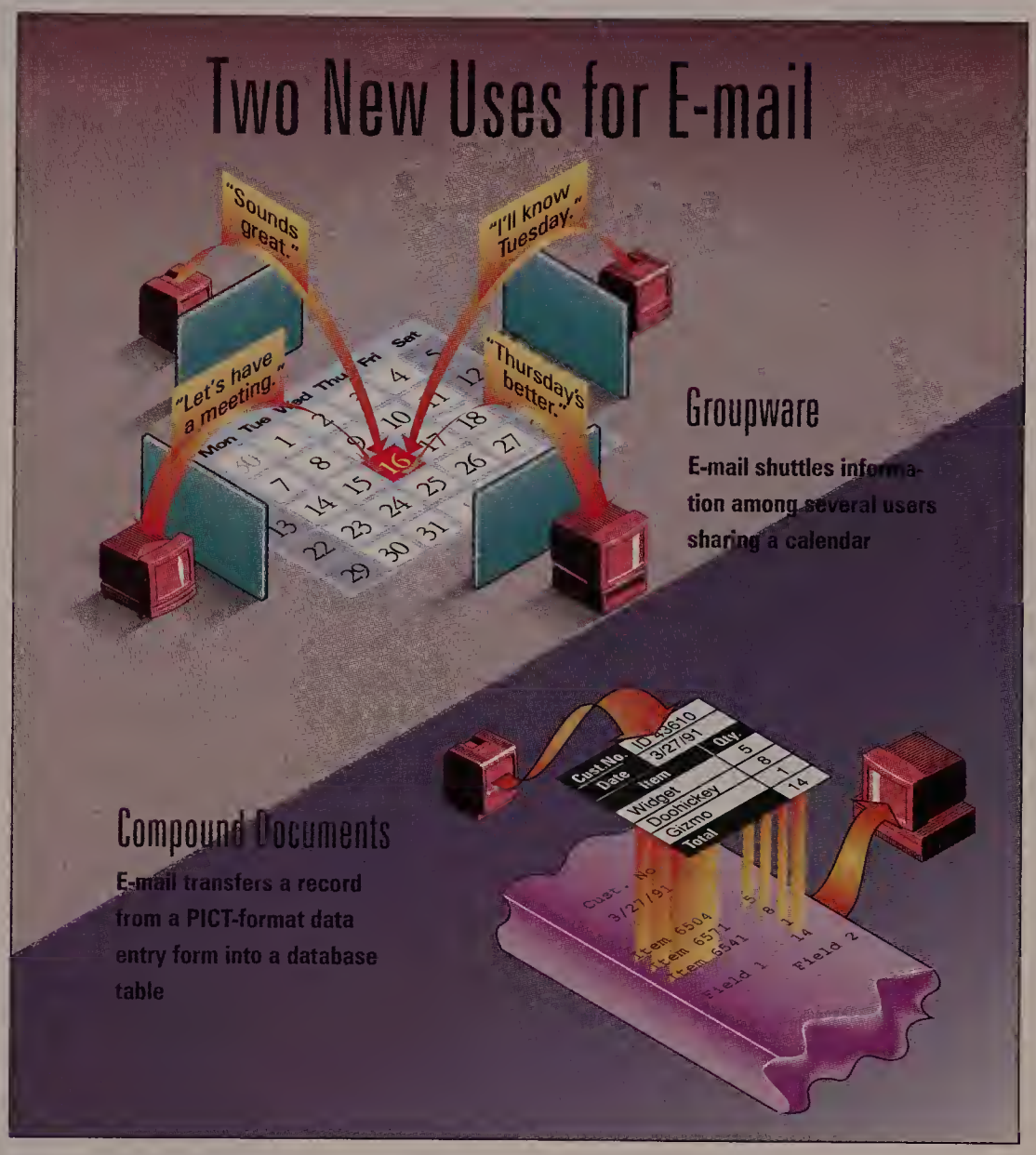
Meta-Mail

As fast as we've accepted electronic mail for sending phone messages and notes across a network, E-mail is changing faster. Microsoft wants its open-architecture E-mail to become the backbone of network-dependent applications—a kind of operating system for groupware. And cc:Mail, a leading electronic-mail package for IBM PCs and compatibles, is evolving into a transport mechanism for compound documents.

Version 3.0 of Microsoft Mail bears a fully packed feature set, including multiple attachments, user-definable address books and aliases, and support for batch-printing messages or appending message contents to text files. (Microsoft Mail lacks two good features that its rival, CE Software's QuickMail, has: a chat screen and an unsend capability.) Mail 2.0's database stored a single copy of messages addressed to more than one person on a local server; 3.0 propagates a single copy of messages going to remote servers as well, leaving each server to determine if the route diverges and requires duplicating a message.

Outside developers are already using Mail for transport services. For example, Status Mac compiles networkwide information using Mail messages, and Magnum's TFLX voice-mail system can attach voice notes to messages. Groupware applications are emerging, such as Syzygy, a low-end project-management package, and Microsoft is planning much more sophisticated network applications.

cc:Mail's first Macintosh product was for clients only, requiring a DOS network to run. Version 1.2 includes



Mac administration tools (remote dial-in and access to gateways still require a DOS server), but the Windows version, using Digital Data Exchange, will be the first with advanced compound-document features.

On the Mac a message with attachments appears as a folder full of files, shown with their proper icons. The server can receive faxes and deliver them as image files; under Windows, you can write on a fax and forward it. Later, you will be able to superimpose and write on transparent layers over a document. cc:Mail will incorporate support for voice and video, and will let you see and edit a document's attachments without the creating applications—even across platforms. Also in the planning stages: more advanced ways to mix data types. For example, you might superimpose a data entry form in PICT format over someone else's database. Eventually, cc:Mail will have identical feature sets for the Mac, DOS, Microsoft Windows, OS/2, and UNIX environments.

Pricing for both products depends on network size. For more information, contact cc:Mail in Mountain View, California, at 415/961-8800; or Microsoft in Redmond, Washington, at 206/882-8080.—**D.L.**

(continues)

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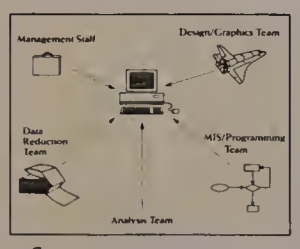
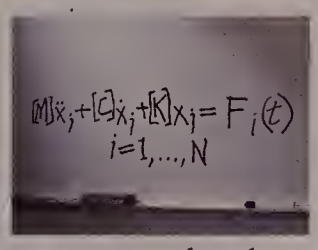


Take a deep breath and consider—HiQ has the richest and most extensive function library of any engineering program. Over five hundred robust built-in functions right at your fingertips. Features and capabilities not available in any other commercial product. Many of the most powerful microcomputer mathematics programs in the world. And HiQ also gives you the flexibility to design your own tools. Imagine having the power and the ability to design and use a specialized engineering tool you've created —in a single day.



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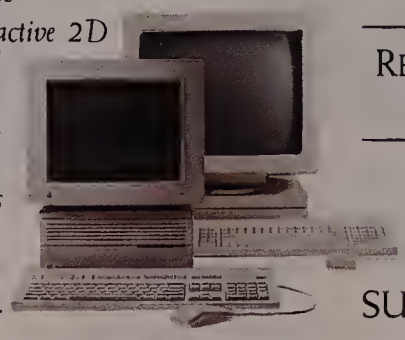

Plus several higher level capabilities. For instance, HiQ's numerical editor enables you to determine both the structure and mathematical characteristics of any matrix of any size. The Optimizer contains linear programming, nonlinear unconstrained and constrained programs based on the best available algorithms successfully used on scientific mainframes. The Fourier and Statistical Analyzers have been developed and tested by specialists in those disciplines. And the scientific graphics program (Grapher) has essentially all the features of a stand-alone program. These include a completely interactive graphical environment permitting a variety of manipulative capabilities (e.g., viewing angle, aspect ratio, zoom in/out, color, shading, perspective/orthographic mode).

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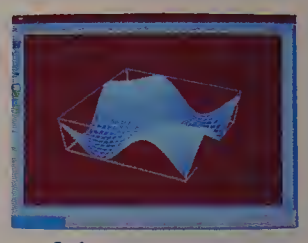

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Visions to Go

For peripatetic users who wish to take their data with them in an ultraportable form, Colby Systems has designed the Pocket Info Pac, a battery-powered device that weighs just over a pound yet can store thousands of monochrome screen images. Not itself a computer, the Pocket Info Pac downloads the screen images from a Mac via a serial port, stores them in RAM, and shows them on the innovative Private Eye miniature display designed by Reflection Technologies.

The 2¼-ounce Private Eye display, worn on a headband, positions a reflecting surface about six inches in front of one eye. A sophisticated optical system directs light onto the reflecting surface, and the perspective fools the eye into believing it sees a larger object that is farther away. The resulting image has a resolution of 720 by 280 and looks as if it measures about 12 inches diagonally. Currently that resolution shows about two-thirds of a standard Mac screen. Colby expects a higher-resolution display to ship sometime in 1991. In the meantime, users can select the desired part of a screen using the marquee, then download the selected part via a desk accessory. Colby is currently working on software that will support downloading the screens remotely via a pocket modem.

With the standard 1MB of RAM, the Pocket Info Pac stores about 150 screens, depending on the type of data the screens contain. With the maximum capacity of 16MB of RAM installed, as many as 2400 frames may be stored, again depending on the type of data. The Pocket Info Pac's rechargeable nickel-cadmium battery has an average life of 6 to 8 hours of use. The device can also use AA alkaline batteries, which last about 12 to 14 hours.

A Macintosh version of the Pocket Info Pac with 1MB of RAM is available now at a price of $899; the price ranges up to $2999 depending on the type and amount of memory. A version for IBM PCs and compatibles should begin shipping in the first quarter of 1991. For more information, contact Colby Systems in Palo Alto, California, at 415/941-9090.—**T.M.**

LUIS DELGADO

The battery-powered Pocket Info Pac (lower right) storage device shows Mac screens on the Private Eye viewer.

Access to Knowledge

Say you just bought a CT scanner. Or an airliner. Or a supercomputer. What are you going to do with the 10,000—or 100,000—pages of documentation that came with it? If your documentation arrived on a CD ROM, you could find room for it on your desk. If the CD ROM came indexed with KnowledgeSet's Knowledge Retrieval System (KRS), you could even find the information in it.

KRS is an indexing- and search-engine designed for static data sets such as technical documentation and reference works. It can search using Booleans, proximity, adjacency, wild cards, and other criteria. If the document's SGML (Standard Generalized Markup Language) tags include hypertext tags, KRS automatically assigns hot buttons where they belong. (For use with KRS, documents must be tagged for SGML. SGML is part of a new federal requirement for contractors to deliver documentation to government agencies in a standardized format.)

BERND ROBERTS

Bryan Preas helped the Association of Computing Machinery put 25 years of publications on a CD ROM with KRS indexing.

KRS lets you assign bookmarks, study lists of cross-references, write yourself notes, or replace pages on the CD (new information goes on a hard drive that must accompany the CD ROM). With GraphicKRS, which recently shipped for the Mac, you can look at vector, PICT, and bitmapped images from the original documentation, zoom in on them, and arrange them in windows side by side with text. GraphicKRS incorporates KRSfax, a bitmap-compression utility that KnowledgeSet also sells separately.

KRS can share CDs across Mac, DOS, and UNIX systems. Later versions will search text in graphics, and a future product line will manage dynamic data sets. KnowledgeSet also makes HyperKRS and SuperKRS for indexing and searching HyperCard and SuperCard documents, and the new version 2.0 of HyperKRS supports almost unlimited stack size.

Prices depend on installation size. For more information, contact KnowledgeSet in Mountain View, California, at 415/968-9888.—**D.L.**

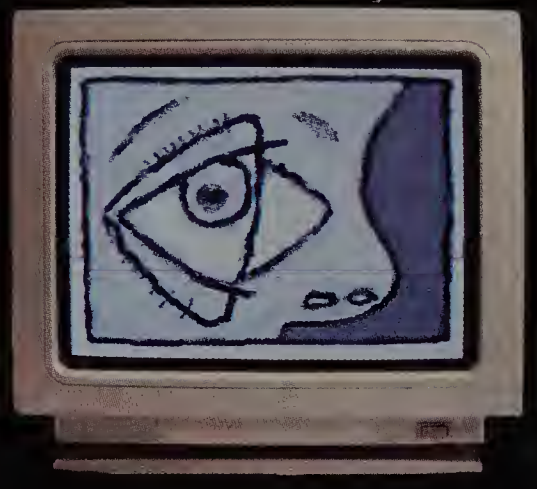
Sigma Boards Speed Lossless Compression

For users whose storage devices runneth over, Sigma Designs has introduced two boards designed to accelerate lossless data compression in the Mac II family. The first board, called DoubleUp, uses a specialized Stac Electronics proces-

(continues)

Big screens for your Mac Classic

So you've got a Mac Classic. Good. Inexpensive. That's good too. Of course you have to live with that little screen, right? No. Put a Publisher Classic™ board in your Mac and presto, little price, big screen. Or very big screen. Have a Mac Portable? Good. Goes anywhere. Of course there is no way to make that Portable Publisher. Got an LC, IIsi or other member of the Mac family... get the picture? Your Macintosh with a Publisher series and a business of any size is suddenly a lot bigger.



Generation Systems 1-800-325-5811.

The Publisher Series works with Generation Systems 15" & 19" monitors and Apple's 15" Portrait & 21" 2-Page monitors. Generation Systems also makes color video boards for the Mac SE/30 and the Mac II Family. ©1991 Generation Systems. 1185-C Bordeaux Drive, Sunnyvale California 94089. Macintosh and Apple are registered trademarks of Apple Computer Incorporated.

Generation Systems, Inc.

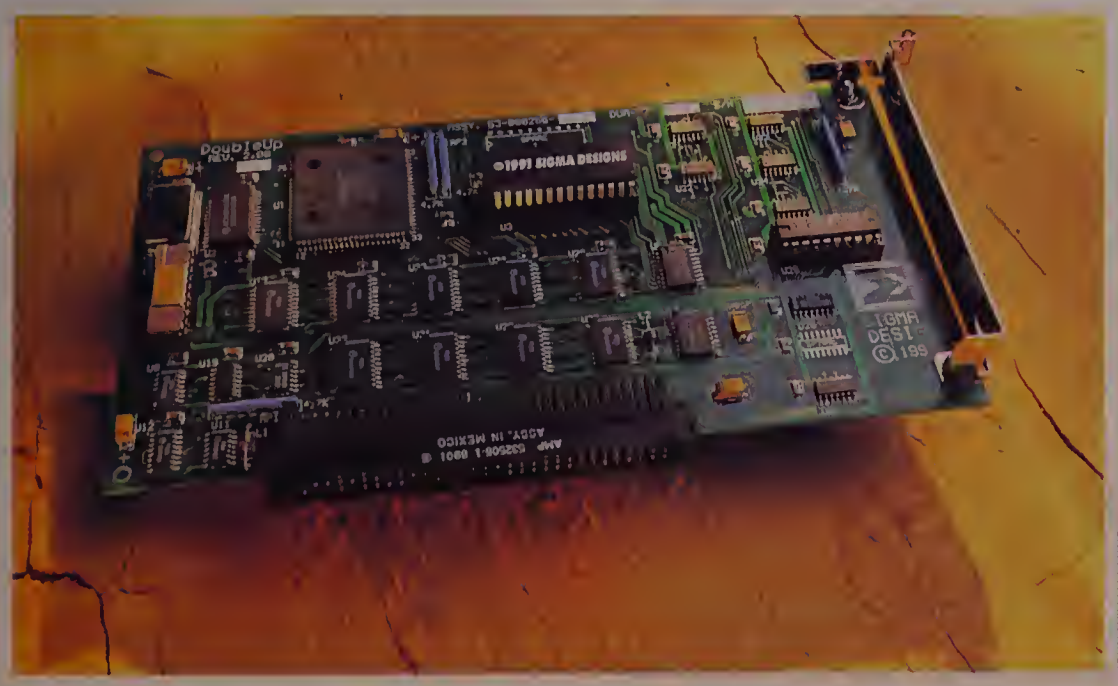
Circle 170 on reader service card

sor chip to compress and decompress images, sounds, data, and programs fast enough that the limiting factor will often be the speed of the Mac's hard drive, according to the company. The second board, called the Sigma Bullet 3040, includes the same specialized compression processor but adds a 40MHz 68030 for general CPU acceleration of the Mac IIcx or IIsi.

Both boards come with DiskDoubler 3.0, the lossless compression software package from Salient Software. Compression is nearly 10 times faster using the boards than it is using the software alone, according to Sigma Designs. On average, the boards and their software reduce files to about half their original size, effectively doubling the capacity of a hard drive.

JPEG and other lossy methods of compressing images or sound can have a much higher compression ratio; that is, the resulting compressed image file is much smaller than would be possible using DiskDoubler and the new boards. By definition, some data is lost in the process, which usually means that there's some acceptable and manageable loss of the quality of the original image. But however good lossy compression methods are for reducing large image files, they are not intended for programs or digital information, since in those cases the loss of even a single bit can lead to catastrophic crashes or data corruption.

DoubleUp for the Mac II series will be available in February at a suggested list price of $229. Sigma Designs plans to come out with an SE version of the board sometime in 1991. The Bullet 3040 for the IIcx and IIsi should begin shipping in March at a list price of $1999. The Bullet 3040 for the Mac IIsi comes with an installation kit incorporating an add-in slot that accepts boards designed for an 030 Processor Direct Slot, allowing further expansion of the system. Also, a 20MHz 68882 math coprocessor can be added for $199 list. On the Mac IIcx, the Bullet 3040 occupies the cache card slot. For more information, contact Sigma Designs in Fremont, California, at 415/770-0100.—**T.M.**



JOHN WILLIAM LUND

Sigma Designs' DoubleUp board contains a specialized Stac Electronics chip that quickly compresses image and data files to about half their original size without any loss of data.

Kodak Unveils Low-Cost Color Printer

Adding to its line of low-cost printers, Eastman Kodak has introduced the Kodak Diconix Color 4, an ink-jet printer that uses a custom chip to control the position of its four print heads and to regulate the amount of ink used. The Color 4 uses thermal ink-jet cartridges developed by Hewlett-Packard for HP's ink-jet printers, but Kodak designed the rest of the printer and formulated its own cyan, magenta, yellow, and black inks. The nonsmear inks are designed to blend together well when producing intermediate colors and to work with plain paper, according to Kodak.

The Color 4's print modes include draft and near-letter-quality, in either

ANN NADLER

The Kodak Diconix Color 4 ink-jet printer uses four nonsmear inks that were specially formulated to blend together well.

10 characters per inch (cps) or 12 cps. The typical print speed ranges from under 4 minutes for a full page of color graphics to about 30 to 40 seconds for a page of text in draft mode at 10 cps. A full page of color graphics takes 4 to 5 minutes to print on a transparency. The printer's resolution is 192 by 192 dpi.

The Color 4 includes an LCD control panel, and the Macintosh version includes a Control Panel device for regulating the proportions of the inks. The printer is currently available at a suggested retail price of $1595. Cyan, magenta, and yellow ink cartridges retail for $19.95 each, and black cartridges retail for $13.95. For more information, contact Kodak at 800/344-0006.—**T.M.**

The Littlest Mainframe

A tiny piece of software called HOPS began life as a utility to accelerate mainframe computers. Now it makes a Mac into a database server that, its developers claim, races past IBM and Amdahl heavyweights.

HOPS (Heuristic Optimized Processing System) is a database kernel, a database development environment, and a metal box (with a bounding rabbit painted on it) that contains a Mac IIfx and some hardware to keep prying eyes away from the kernel. HOPS executives claim HOPS typically requires a single disk access to complete a retrieval, even with enormous files, because it indexes a billion-record file in 1MB of memory.

In informal tests, HOPS's random generator filled a four-field database

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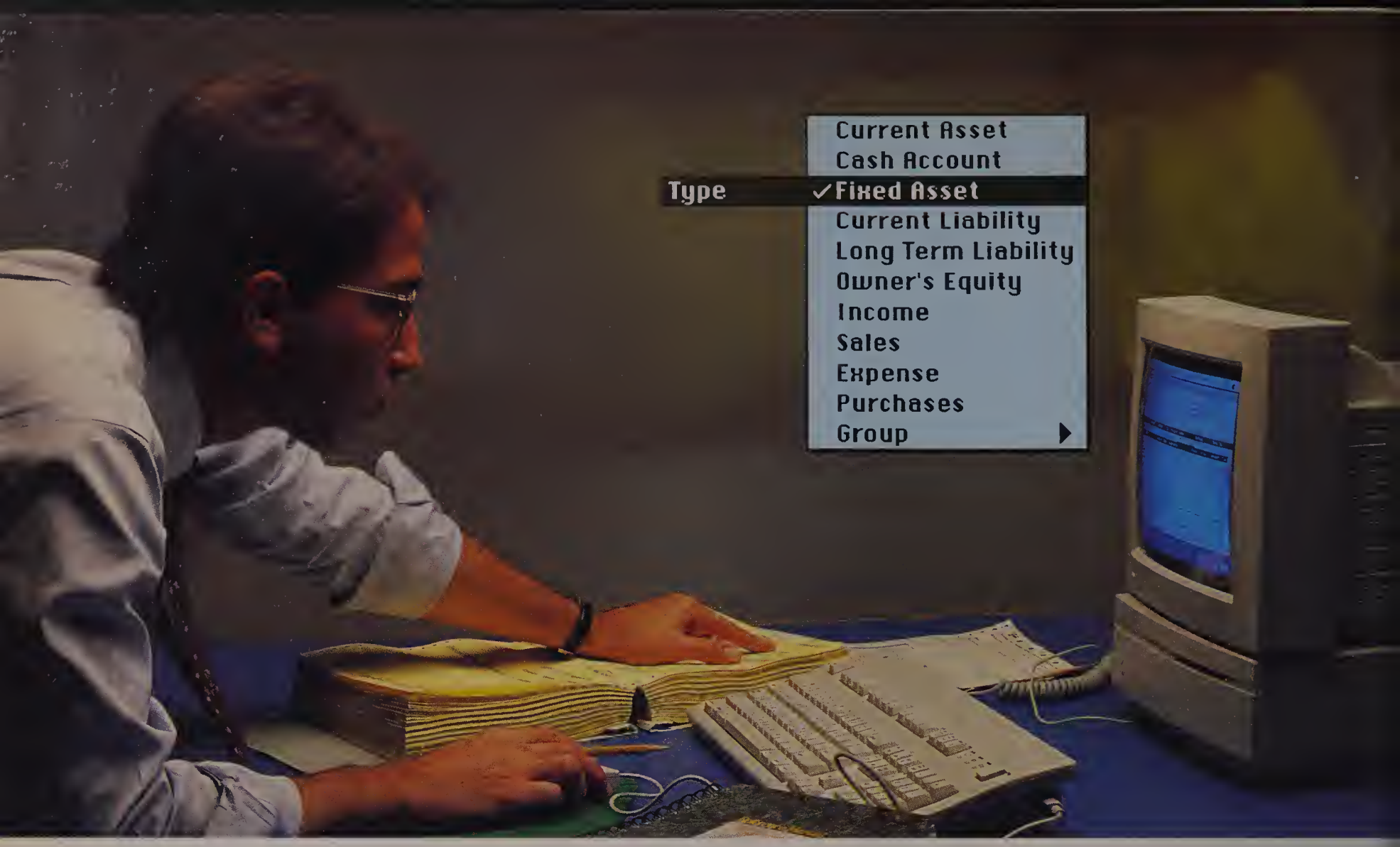

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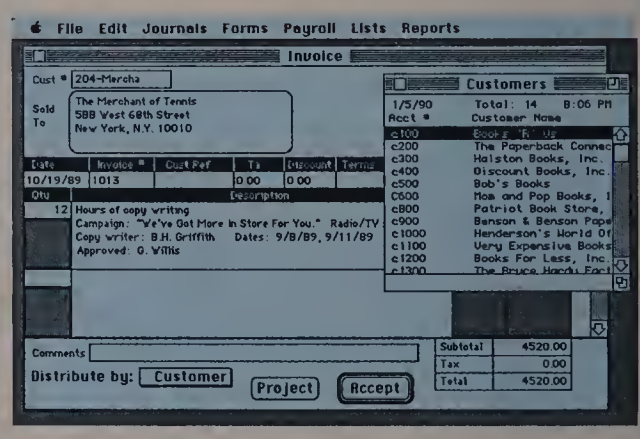

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with 1 million records in less than two minutes, and then ran multifield, multicriteria searches in less than half a second.

HOPS takes over the Mac, using the Mac's operating system for some functions but essentially running the Mac like a mainframe, providing such mainframe-like features as setting priority levels for users and automatically partitioning a query across multiple servers based on where data is stored. It also can manage other mainframe necessities such as fault tolerance (recovery from crashes or hardware failure) and communications.

ACEY HARPER

A hard day's work in Miami Beach: (left to right) Larry Fischell, Bob Gaston, and Harvey Goodman of HOPS.

HOPS provides tools for interface design, as well as a development language that HOPS president Harvey Goodman claims is very robust and extensible by skilled programmers. HOPS can handle any data type (for example, it can compare digitized fingerprints), but it lacks utilities for converting database structures to HOPS structures.

HOPS plans to sell its servers "at mainframe software prices," Goodman says, making the cost of the IIfx inside the HOPS box negligible. However, "Our policy is, Don't pay for it until you like it. We're willing to put our money where our mouth is." For more information, contact HOPS in Miami Beach, Florida, at 305/672-2361.—**D.L.**

PostScript on Non-PostScript Printers

With PostScript cartridges available for the HP LaserJet and other "dumb" laser printers, it was only a matter of time before someone took the next step, the creation of a stand-alone box that enables a Macintosh to print PostScript files on virtually any printer.

So, upstart Pacific Rim Data Sciences has taken that step, announcing the shipment of its PageBlaster, PageBlaster Plus, and HappyBlaster products. These devices are variations on the same theme, the use of a processor board that sits between the Mac and a "dumb" printer and performs the rasterization process that is normally done by the PostScript part of a PostScript printer. In the PageBlaster products, the board also offers a doubling of the horizontal resolution to 600 by 300 dpi. All of the PostScript rasterization products come with Imagen's UltraScript interpreter, which enables the Mac to turn PostScript files into bitmapped images.

If you have an HP LaserJet IIP, there's the HappyBlaster Board (and enclosure), which takes the place of the back panel of the IIP that houses the parallel and serial connectors. The HappyBlaster receives its information from the Mac's SCSI port, then converts it to the parallel port on the IIP for decompression and printing. The $649 version contains UltraScript and the 35 LaserWriter fonts, while a cheaper version, at $498, uses JetLink Express, a QuickDraw driver, instead of UltraScript. The version with both UltraScript and JetLink Express costs $798.

LUIS DELGADO

PageBlaster and its UltraScript software rasterize PostScript files into bitmaps for output on a non-PostScript printer (rear).

The HappyBlaster does not have the dual resolution (600 by 300 dpi or 300 by 300 dpi) feature, but the PageBlaster does. PageBlaster also has the ability to translate the SCSI port's data directly into the video connector on any laser printer with a Canon engine, such as the HP LaserJet line, the Canon line, and the Fujitsu FX series. This process bypasses the printer's controller and allows data-transfer rates of up to 1.2MB per second, although the HP LaserJet Series II and III will require an optional video board priced at $195 to receive the signal. The PageBlaster Plus system, which includes UltraScript, is priced at $895.

If you have a dot matrix printer, there's a version of the PageBlaster that converts data from the Mac's SCSI port to the parallel port on the dot matrix printer. That version costs $795, including UltraScript.

Using either the HappyBlaster or the PageBlaster, a Macintosh can act as a print server for any other systems on a LocalTalk or other network. For more information, contact Pacific Rim Data Sciences in Fremont, California, at 415/651-7935.—**Martin Marshall**

Fax (415) 226-9691

CoStar Addresses Envelope Printing

Designed to end the hassle of printing envelopes and to save money on mailings, AddressWriter is a compact printer that prints a logo, two addresses, a short message, and a postal bar code on up to 100 envelopes at a time. Although the basic AddressWriter handles only envelopes, its developer, CoStar, will offer an optional $75 label-handling attachment. Under 1991 regulations, the U.S. Postal Service offers discounts of 10 percent or more on mail that is bar-coded by the sender.

The AddressWriter comes in two versions: a serial model for IBM PCs and compatibles, and a model with a

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Aldus® Persuasion™ 2.0 is the fastest way to create impressive visuals for all your meetings. In fact, all the overheads above were created in just 30 minutes. That's productivity no other method or Macintosh® program can beat—and test results prove it.

Simply type text into Aldus Persuasion's outliner, and your visuals are automatically formatted. Persuasion 2.0 is a complete solution for creating organization charts, diagrams, and a variety of graphs, with features like 36 pre-designed templates, spell-checking, and a library of clip art. So all you provide is the content—Persuasion does the rest.

In a recent performance test, Persuasion outpaced other Macintosh programs.

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Of Persuasion's many accolades, *MacWeek* summed it up best: "...the best presentation package available."

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ANNE NADLER

AddressWriter prints addresses, logos, and postal bar codes on envelopes, postcards, and labels (with optional label handler).

serial port for the Mac. Both serial versions will retail for $595. The Mac model comes with a customized version of MacEnvelope, which can be accessed either as a stand-alone application or as a desk accessory. The software can handle multiple mailing lists of up to 1600 addresses each. It also supports different font sizes and styles, and it can import and export lists from most common applications. CoStar plans to introduce an AppleTalk version sometime in 1991.

When printing the addresses, a logo, a short message, and the postal bar code, the AddressWriter takes about 20 seconds per envelope. When printing on stationery that already has one address and a logo, for instance, the printing time is considerably less. The printer accepts envelopes up to 4⅓ inches tall, and with the label-handling option attached, it can accept pin-fed labels that measure up to 5¼ inches from pin to pin.

At press time, CoStar expected to begin shipping both initial models of the AddressWriter in January. The label-printing option will have a list price of $75. For more information, contact CoStar in Greenwich, Connecticut, at 203/661-9700 or 800/426-7827.—**T.M.**

Blank Canvas

Is plain old drawing on the Macintosh dead? Between 32-bit paint programs, the merger of sketching and CAD, and the failure of most draw programs (Draw It Again, Sam; Drawing Table), basic drawing seems almost forgotten. Fortunately, Claris has written a big upgrade to MacDraw (see *Macworld News,* "MacDraw Goes Pro," February 1991), and now Deneba is getting Canvas 3.0 ready.

Canvas 3.0's new features include much stronger text-handling tools, drawing tools that look a lot like FreeHand's or Illustrator's, and smarter technical illustration.

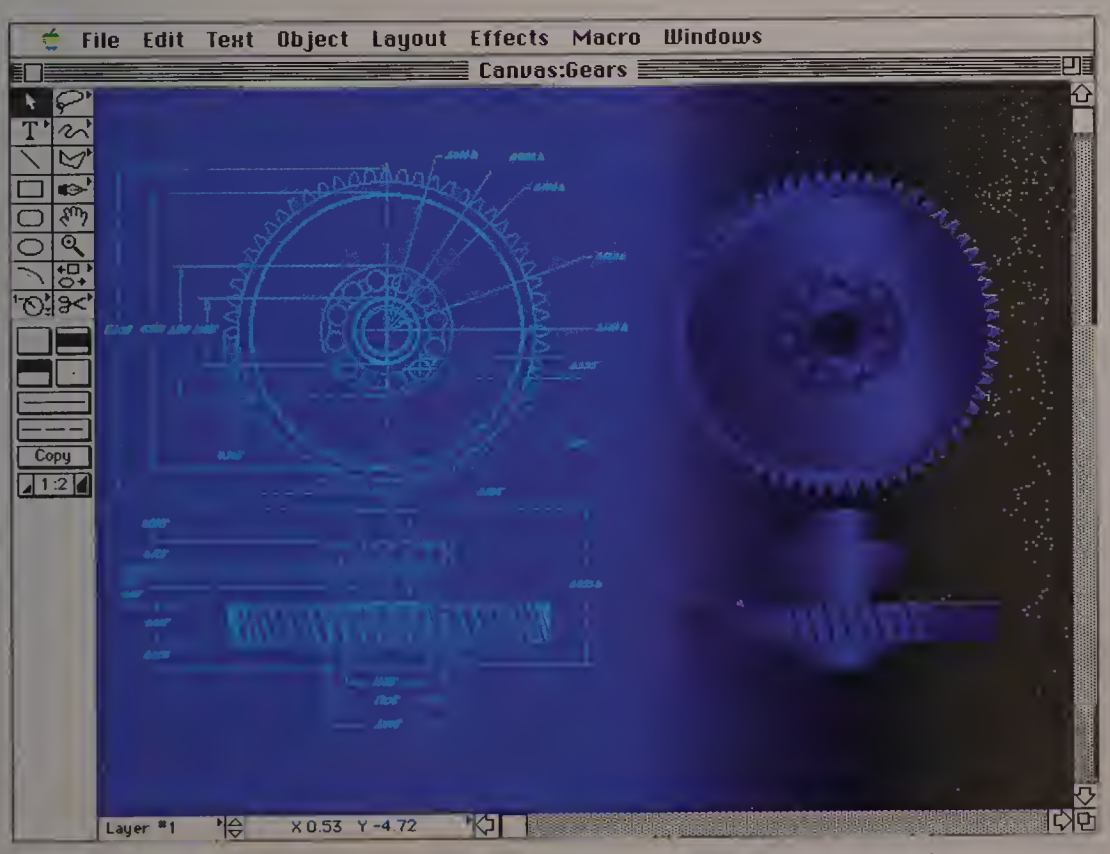
Text blocks in Canvas 3.0 can have their own rulers, and support tab leaders, full justification, and leading or tracking by half-points (with only one setting per block). Text can align with independently slanted margins, bind to a curve, or wrap inside or outside an object, and Type 1–format text can be converted to editable curves.

You can add cusps (temporary points) to bezier curves, and select multiple points on a curve—or even on more than one curve—and manipulate them. Canvas now provides blends between objects just as Illustrator, FreeHand, and MacDraw Pro do. Also like the 3.0 versions of Illustrator and FreeHand, Canvas 3.0 can composite objects so that you can see through a hole in an object to the objects behind it.

For technical illustrators, Canvas has standard architecture hatching and a smart mouse. The mouse guesses what you're trying to select, and its icon changes to indicate when you get close—for example, if you are near a tangent or a corner.

An unusual feature in Canvas is its ability to search for objects by attributes—for example, to find all the gray rectangles in layers 10 through 50 and replace their fill with concrete hatching. Version 3.0 also reads and writes DXF, IGES, and Illustrator 88 formats, and it has a plug-in structure for adding new features easily.

Canvas 3.0 will list for $395. For more information, contact Deneba in Miami, Florida, at 305/594-6965.—**D.L.**



Double Canvas: improved technical illustration makes Canvas 3.0 more CAD-like, while other features make it more of a designer's tool. (Note stars showing through hole in gear.)

CD ROM Preserves High-School Days

Imagine nostalgically browsing your high-school yearbook. You find the photo of a friend, read about her accomplishments—then listen to her recite her poetry. Yes, multimedia yearbooks have arrived, thanks to CD ROM technology and the pioneering determination of students in Eugene, Oregon.

The South Eugene High School students' SuperCard stack blends animation and sound with the text

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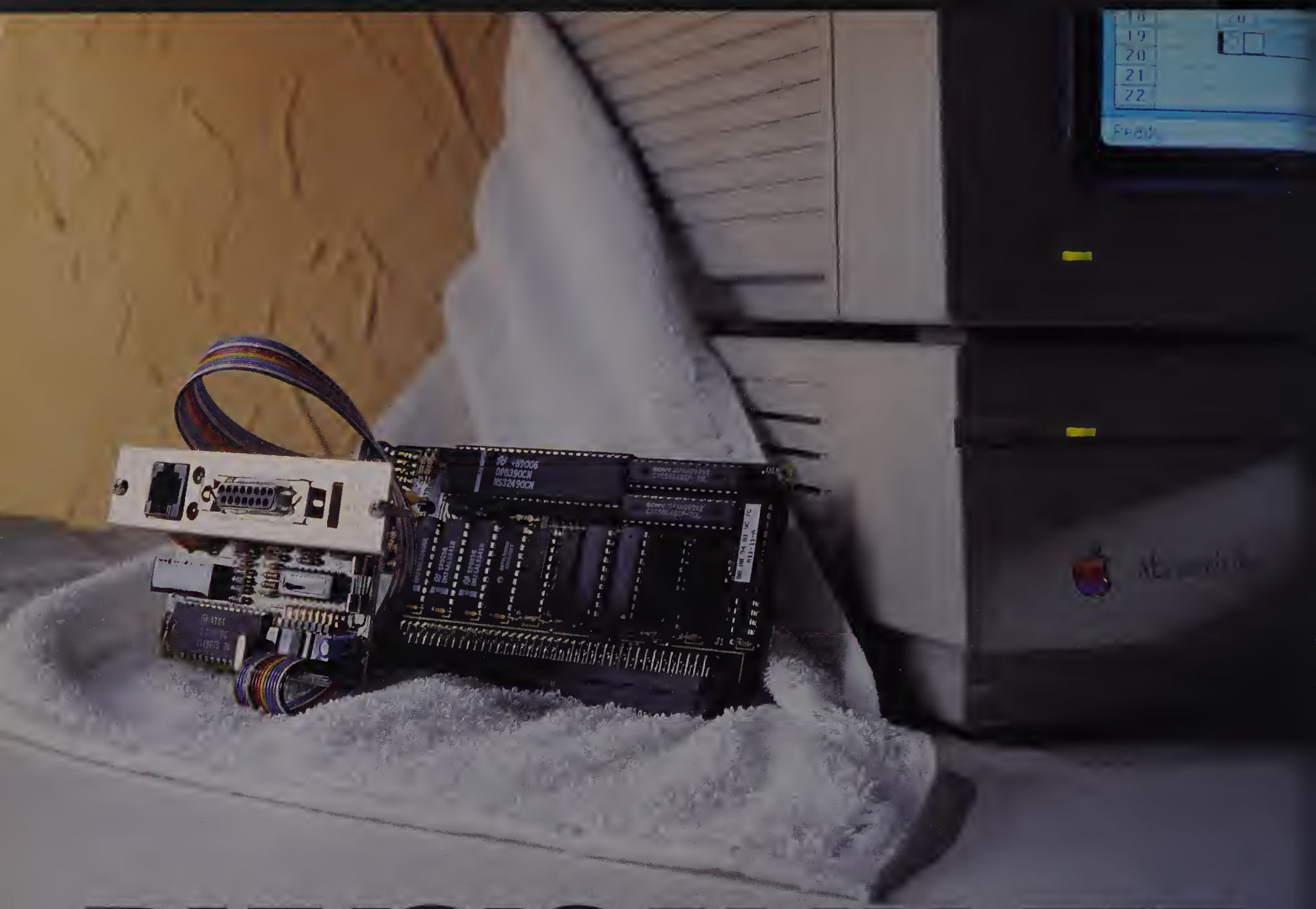

PHYSICALLY FIT

Introducing the only IIsi Ethernet cards that fit without an adapter.

If you're adding Ethernet to a Macintosh® IIsi computer, there is one thing you need to know. The new low profile of the IIsi requires all existing Ethernet cards to use an additional, expensive adapter.

The exceptions however, are the MacCon+™ 30i cards from Asanté.™ They are the only Ethernet cards designed specifically for the Macintosh IIsi that don't need an adapter.

Eliminating the adapter saves you money. But, if you prefer to use the math coprocessor available on some adapters, you'll be happy to know that the MacCon+ 30i cards are fully compatible with all adapters as well.

To create the MacCon+ 30i, we took the technology that MacUser said, *"buried the competition in raw performance tests,"* and put it in a small, elegantly designed IIsi package. The result is blindingly fast Ethernet performance on the fastest Mac bus.

Along with this performance comes unmatched compatibility and reliability. The MacCon+ 30i cards are register-level compatible with Apple's Ethernet card and both run A/UX. With their lower chip count, the MacCon+ 30i cards run cooler and have fewer parts. That translates to fewer problems. They're even backed by a five-year warranty.

Asanté Technologies is the only company that offers a full line of Ethernet products for all Macintoshes. If you're simply adding a IIsi to an existing network, or creating a complete high-performance Ethernet network from scratch, turn to Asanté for all the right connections.

The MacCon+ 30i comes in thick/thin and 10BaseT versions and is available now from your Asanté reseller. Call them today for full details.

ASANTÉ

Asanté Technologies, Inc. ▪ 404 Tasman Drive ▪ Sunnyvale, California 94089 ▪ (800) 662-

Resellers: Asanté products are available from Ingram/MicroD, Merisel/Macamerica, and Tech Data

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Circle 24 on reader service card

JAMES FOLTS

These students are at work on a yearbook that will include videos of school sports and recordings of school musicians.

and photographs of conventional yearbooks. The students used MacroMind Director to create animated menus, interFACE to introduce a friendly English-speaking guide, Digital Darkroom to touch up photos, and MacRecorder to digitize voices and music. With no precedent to follow, they agonized over trade-offs dictated by designing screen-shaped translations of traditional two-page spreads. To simplify navigating the huge hierarchy of information, they invented special icons called GROFS—Graphical Representations of the Outline File System.

For the 1991 yearbook, the students plan more ambitious ways to exploit the medium. Electronic Eugenean editor Thor Prichard is excited about integrating sports videos and musical performances. "We're trying to make it a true representation of what it was like to be a student in 1991."

And what about students who find a CD in a pocket of their yearbook but have no access to computers? "We tell them to hang on to it," says student Aaron Ray. "In five years CD ROMs will be cheap and standard."—**B. J. Novitski**

VIRUS WATCH

Current viruses, Trojan horses, and worms affecting the Macintosh community.

MODM and zero
Type: Viruses
First listed in Virus Watch: 3/91
Info: Both are nVIR B clones; infect applications and system files.
Impact: Nondestructive; can cause crashes.

ZUC B
Type: Virus
First listed in Virus Watch: 3/91
Info: A ZUC clone.
Impact: Nondestructive; infects applications and system files; renders cursor inoperable.

MDEF C
Type: Virus
First listed in Virus Watch: 2/91
Info: A Garfield strain; infects applications and system files.
Impact: Nondestructive; can cause crashes.

prod
Type: Virus
First listed in Virus Watch: 2/91
Info: An nVIR B clone; infects applications and system files.
Impact: Nondestructive; can cause crashes.

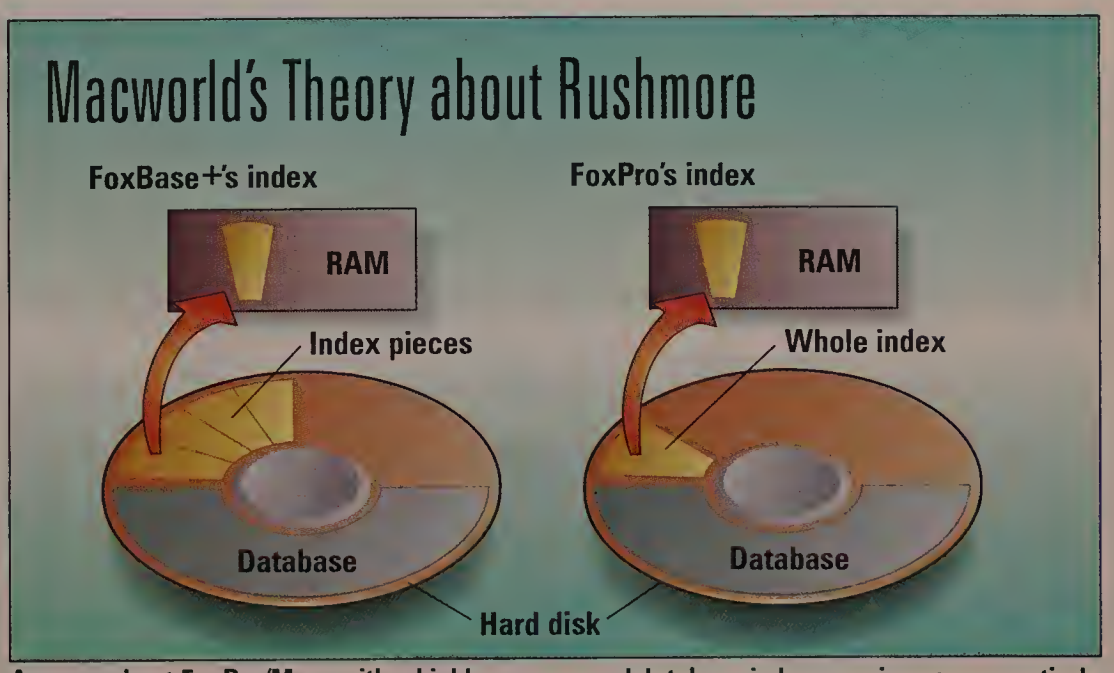
Bigger Foxes

FoxBase/Mac's early speed records were impressive, and later versions added a Macintosh interface without slowing down. Now Fox says its latest, FoxPro/Mac, searches large disk-based databases a hundred times faster than before. (Fox has applied for several patents on a piece of technology code-named Rushmore.) New indexing algorithms require converting old data files, but the new product is compatible with FoxPro/DOS and can use dBase IV programs and data.

Fox claims that during in-house tests on a single-user system, FoxPro/Mac retrieved several thousand street names from a single-table, 1.6-million-record, 140MB address database in one or two seconds per name. Fox gave *Macworld* a hint at how Rushmore works, pointing out that the bottleneck is normally in calling up records from disk to see if they match search criteria. So Rushmore probably uses FoxPro's very compact indexing method to search a RAM-resident index, and then sweeps all the finds from indexed disk locations in one or two passes, thus bypassing much slower disk-based operations.

This makes the Mac on your desktop competitive with mainframes in dealing with huge quantities of data. (Mainframes still have advantages in transaction-processing and security features, but Fox claims third-party developers are currently writing these big-database functions in the Fox language.) FoxPro also includes a SELECT command and a large subset of other SQL commands for complex searches, and a new query-by-example scheme shows users how SELECT statements are constructed. New tools speed creating custom menu bars, adding pop-ups and keyboard enhancements, and developing custom applications.

Pricing for FoxPro/Mac was not set at press time. For more information, call Fox Software in Perrysburg, Ohio, at 419/874-0162.—**Charles Seiter** M



A guess about FoxPro/Mac: with a highly compressed database index, queries can run entirely in memory, and FoxPro accesses the disk only when it's ready to retrieve records.

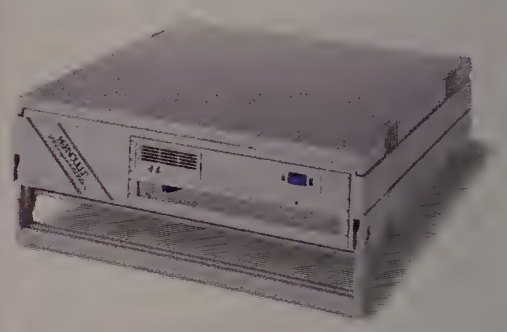
HIT THE ROAD, MAC.

In a shakedown of removable storage devices, one drive quickly rises to the top. The new 44MB Bernoulli® Transportable. A drive that delivers reliable hard-disk-like performance day in and day out. In the office or on the road.

drives have an unbeatable MTBF of 60,000 hours. And Bernoulli's 44MB disks can take 1,000Gs of shock force (or an 8-foot drop). We back that up with an unprecedented Gold Standard 5-year media life limited warranty.

The Transportable's performance puts you in the fast lane, too. A high transfer rate, with an intelligent buffer and user-configurable cache, gives Bernoulli exceptional real-life performance.

If you'd rather go cordless, there's a battery-powered version, which, like the Transportable fits neatly under a Mac SE. And now,



Bernoulli takes your dollar the extra mile with dramatically reduced prices (up to 20 percent) that affect the entire Bernoulli family, including the Dual.

Which all adds up to one thing: Bernoulli's closest competition isn't close at all.

So call 1-800-777-6217 for free Bernoulli literature. Because no matter what road you travel, Bernoulli is the only system that can take it. Over the long haul.

Bernoulli's patented design draws a flexible disk up to the read/write head. Which, unlike hard disks, makes Bernoulli virtually head-crash free. Should the drive encounter a jolt or a dust particle, the disk falls harmlessly away from the head, making Bernoulli the most reliable removable system available. Period.

The numbers tell the story. Bernoulli

THE BERNOULLI ADVANTAGE

Drive Reliability	*Bernoulli*	*Syquest**
MTBF	*60,000 hrs*	*30,000 hrs.*
Media Reliability		
Media Warranty	*5 yrs.*	*2 yrs.*
Drop Height	*8 ft.*	*2.5 ft.*
Non-operating Shock	*1,000Gs*	*100Gs*
Performance		
Effective Access Time	*22 msec.*	*20 msec.*
Transfer Rate	*8-12 Mbits/sec.*	*4 8 Mbits/sec.*
Large File Dup. (3)	*27 sec.*	*34 sec.*
Small File Dup (many)	*82 sec.*	*174 sec.*
Installed Base		
Drives	*625,000*	*300,000*
Media	*3,750,000*	*1,000,000*

**Includes Mass Micro, PLI, Ehman*

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STORAGE SOLUTIONS BY IOMEGA®

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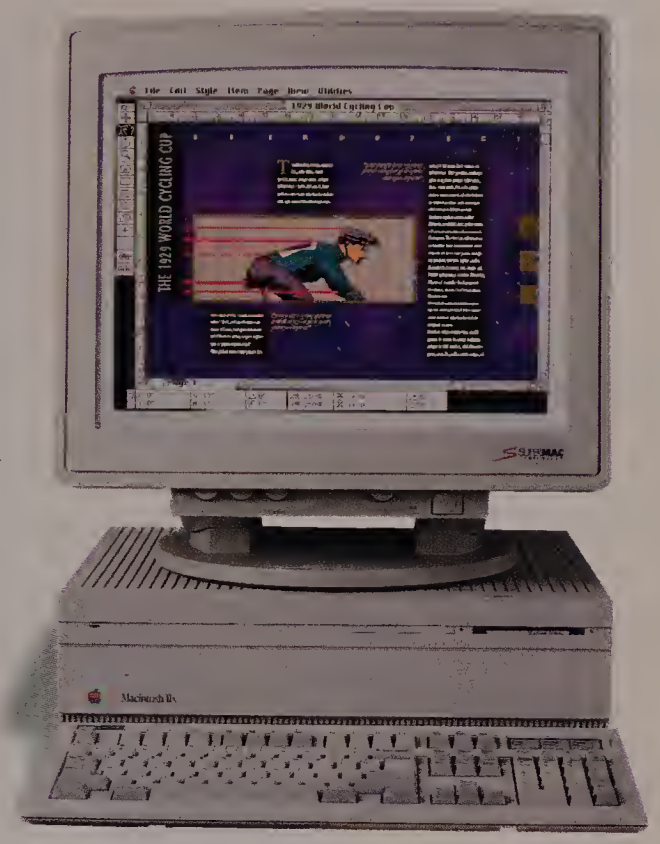
Circle 260 on reader service card

The Professional's Choice

QuarkXPress 3.0 only $525

QuarkXPress® has long been the professional's choice for publishing software worldwide because of its powerful and precise type handling, page layout, and graphics production features. The new 3.0 version delivers all these, with a redesigned interface and clear, comprehensive documentation that make QuarkXPress easier than ever to use.



Interactive and Effective

QuarkXPress 3.0 provides an array of interactive palettes that make it simple for new and experienced users alike to create effective, high-quality publications. A document layout palette enables you to insert, delete, and move pages easily by dragging page icons. And the new Library palette provides an easy way to store text and graphic items for use whenever they're needed.

Text Creation Simplified

QuarkXPress offers full-featured WYSIWYG word processing and editing capabilities that give you the look and feel of your document while you're creating it. The Global Spelling Check and Find/Change features make fine-tuning easy.

A Tradition of Precise Type Handling

QuarkXPress 3.0 continues a tradition of providing the most precise, flexible type handling of any comparable program. You can adjust font, size, style, leading, location, and angle of rotation in fractions of degrees, right on the screen. Whether you're creating automatic drop caps or editing already-rotated type, QuarkXPress 3.0 delivers the power and freedom you need to create the most eye-catching text possible.

The Designer's Choice

Because of the power and responsiveness of its page layout features, QuarkXPress is now the top choice of designers around the world. The program's advanced capabilities — including the rotation and skewing of graphics, picture box reshaping, rotation of text, and the creation of bleeds — make QuarkXPress the most flexible page layout program around.

Complete Control Over Color

With QuarkXPress, you can apply process or spot colors to any EPS graphic. What's more, you can create color separations without resorting to an add-on program. Besides supporting the PANTONE MATCHING SYSTEM®*, as well as RGB, CMYK, and HSB models, version 3.0 provides precision controls for trapping and other sophisticated prepress effects.

Easy To Learn And Use

Even if you've never used QuarkXPress before, you'll find this 3.0 version simple to learn and explore. The handy on-line Help system and clearly written user manuals that come with the program—in addition to the step-by-step, self-paced tutorial—quickly put you in charge of the most powerful publishing tool of its kind.

Overnight Delivery Only $3.00

QuarkXPress 3.0 is available now — and you can have it tomorrow. Order before 12:00 midnight (E.S.T.) and we'll ship overnight for only $3.00. When it comes to getting the newest products at the best prices, nobody beats MacWAREHOUSE — nobody!

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Item #DTP 0049 *FaxFACTS 2509*
Publisher: Quark, Inc.

MacWAREHOUSE Low Price:.....$525

System Requirements: The enhanced QuarkXPress 3.0 requires a Macintosh Plus, SE, or II series with a 6.0 or later operating system, 2MB of RAM (extra memory required for color or graphics-intensive applications), a hard drive, and a LaserWriter 5.2 or 6.0 printer.

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seven days a week.
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MWD1Q

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FREE! STEP-BY-STEP VIDEO INSTRUCTIONS**

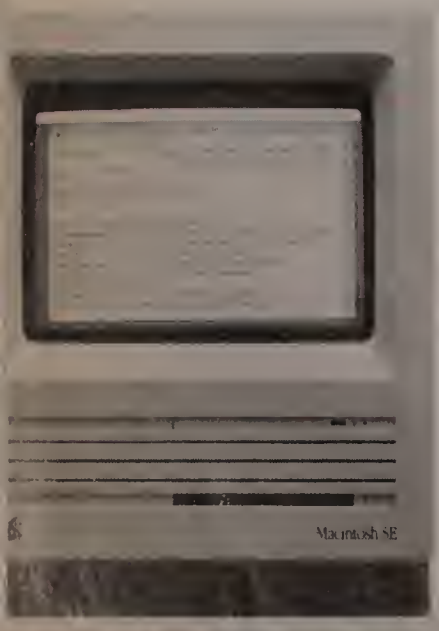
A MacWarehouse Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable overnight service will have your Kit in your hands tomorrow!

MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spread-sheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. Just open your Mac, slide out the main circuit board and plug in your SIMMS. Our FREE video will give you STEP-BY-STEP installation instructions. Every type of Mac is covered and we think we've made it a breeze.



WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs - (2 @ $59 ea.).

The chart explains exactly what you need to achieve the desired level of performance.

To upgrade a 4-socket Mac Plus or SE to this amount of memory.	Do this: (Install in multiples of two only)
2 MB	Remove all four existing 256K SIMMs, install two 1 MB SIMMs, leave two sockets for future expansion.
2-1/2 MB	Remove only two 256K SIMMs, install two 1 MB SIMMs.
4 MB	Replace all four 256K SIMMs with four 1 MB SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, oe SE 30 to this amount of memory.	**Do this: (Install in multiples of four only.)**
4 MB	Remove all four existing 256K SIMMs, install four 1 MB SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1 MB in remaining sockets.
8 MB	Remove all four 256K SIMMs, install eight 1 MB SIMMs.

To open your Mac Plus or SE, you'll need a specially designed tool - it's available from us as part of a handy tool kit for just $9.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMS (Single Inline Memory Modules). Each one megabyte SIMMS card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.
Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 100ns SIMMs is $59. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help you make your choice an easy one.

SPEED

Do you need 80, 100 or 120 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor reads 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

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Place your order by 12:00 am (E), weekdays and we'll deliver overnight for just $3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

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MACWAREHOUSE 30-DAY MONEY BACK GUARANTEE

If, for any reason, you are dissatisfied with your MacWAREHOUSE Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return this product, postage paid, in its original condition, with the original packaging and documentation.
ONE YEAR WARRANTY. MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

* SIMMs prices vary. Call for latest information.
** Limited Offer! Free video with purchase of 2 or more SIMMs.

MWD1P

The Power User™ Hard Drive from MacWarehouse

20MB - only $329

MACWAREHOUSE TAKES THE HARD WORK OUT OF BUYING A HARD DRIVE.

The PowerUser Hard Drive is loaded with all the features you'd expect from a top quality drive. It's made for MacWAREHOUSE by a leading manufacturer - to our exacting specification. Its superior design fits right under the Mac Plus, Classic or SE, bringing the screen up to a convenient height.

STATE-OF-THE-ART COMPONENTS.

The PowerUser Drive is packed with quality components like the "state-of-the-art" Seagate hard disk. There's a rear panel SCSI address selector switch, two 50-pin SCSI connectors, and removeable internal SCSI terminators for your convenience.

The PowerUser Hard Drive includes the popular "Disk Manager Mac" software by On Track, and is pre-formatted - ready to use right out of the box.

Each unit goes through thorough quality control and testing before it leaves the factory. The comprehensive "User Manual" includes all the necessary step-by-step instructions.

20MB Hard Drive $329	60MB Hard Drive $469
30MB Hard Drive $369	80MB Hard Drive $519
45MB Hard Drive $419	44MB Removable HD $629

THIRTY-DAY MONEY BACK GUARANTEE.

Try the PowerUser Hard Drive for thirty days, and if you're not completely satisfied, call us for an RMA number and return it with all of its documentation for a full refund.

The PowerUser Hard Drive is covered by a one year manufacturer's warranty and, if you do ever have a problem, the MacWAREHOUSE loaner drive program guarantees you'll never be without a drive for more than a few hours.

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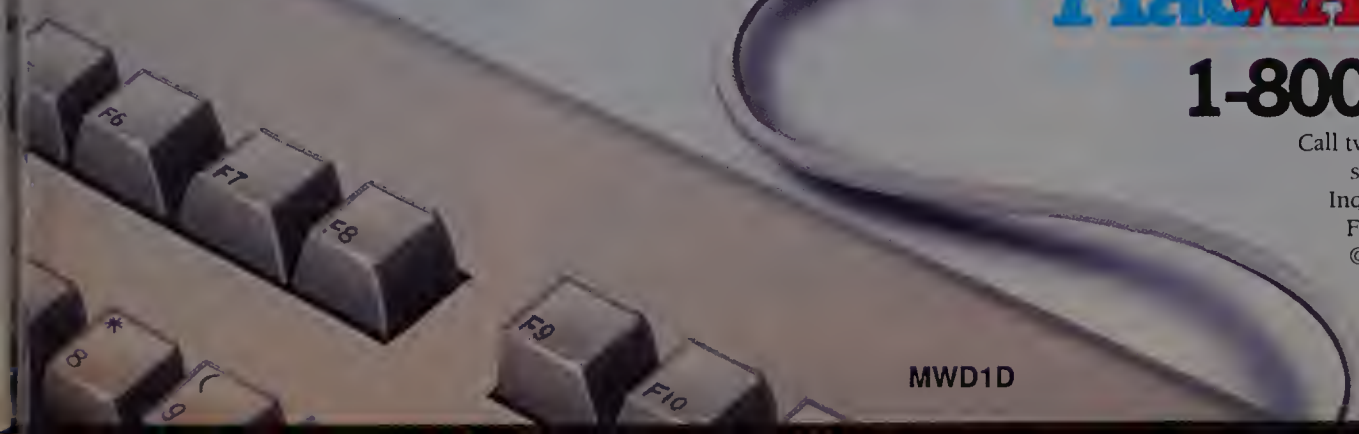

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ACC0458	200DL UPS	159.
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ACC0454	520ES UPS	419.

Apple

ACC0336	Toner Cartridge - LaserWriter II	105.

Basic Needs, Inc.

ACC0356	Dust Cover - Mac II & Extended Keyboard (grey nylon)	12.
ACC0348	HardTops ImageWriter II Cover	16.
ACC0347	HardTops Mac Extended Keyboard Cover	15.
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ACC0466	MacIIcx/ci Monitor Stand	49.
ACC0351	Utility Pac	11.

B.A.S.F. (BASF)

MED0030	Disks - DS/HD 1.44 Meg (box of 10)	22.
MED0041	Disks - Preformatted DS/DD (box of 10)	14.
MED0040	Disks - Preformatted DS/HD (box of 10)	25.
MED0029	Disks - DS/DD (box of 10)	12.

Curtis

ACC0469	Command Center	89.

Ergotron

ACC0344	MacTilt II - 13" Color RGB	75.
ACC0128	MacTilt Plus/512 - Platinum	68.
ACC0009	MacTilt SE, SE/030 - Platinum	68.

I/O Design, Inc.

ACC0028	MacLuggage™ Plus Carrying Case	64.
ACC1070	MacLuggage™ SE Carrying Case	75.
ACC0427	Ultimate SE Carrying Case - Black	69.
ACC0440	Ultimate SE Carrying Case - Navy	69.
	Ultimate SE/Plus Neon Carry Cases	ea.89.

M.Y.O.B. 2.0 (Teleware)
1990 MacUser NOMINEE

Streamlines your accounting, and delivers essential information on the status of your business. For example, create a sales invoice, and M.Y.O.B. adds the amount to receivables, decrements the inventory, and generates the monthly customer statement. If the inventory is low, it puts a reorder message on your To Do List. Integrating G/L, A/R, A/P, Inventory and card file, M.Y.O.B. gives you the informative reports you need to run your business. **FIN0087 $145.**

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ACC0459	Maccessories SE Radiation Anti-Glare Filter	52.
ACC0097	System Saver Mac - Platinum	63.

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ACC0055	Fanny Mac QT	55.
ACC0247	SE Silencer	39.

PowerUser™

BND0013	PowerUser Carrying Case w/Free Cap	69.

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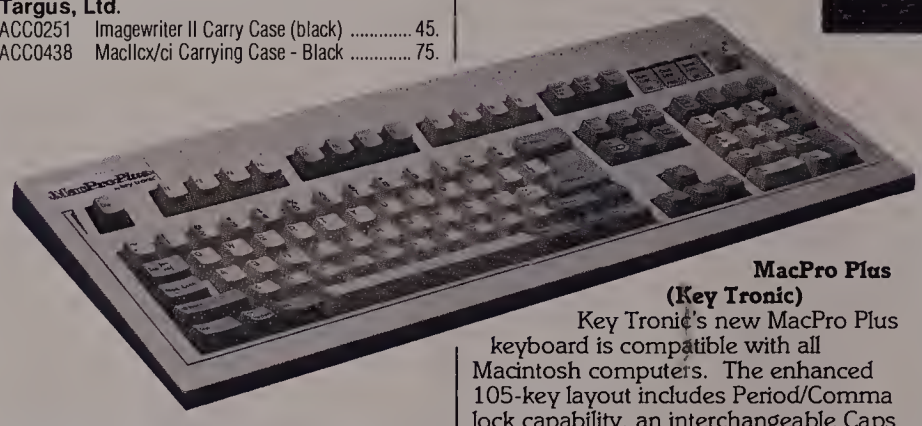
MED0031	Disks - 1.44 Mb High Density (3.5)	24.
MED0003	Disks - DS/DD (box of 10)	13.

Targus, Ltd.

ACC0251	Imagewriter II Carry Case (black)	45.
ACC0438	MacIIcx/ci Carrying Case - Black	75.

Smart Alarms 3.0 & Appointments Diary 3.1 (JAM Software)
Let Smart Alarms and Appointment Diary take care of your daily schedule. Just enter your appointments into the diary, and let Smart Alarms remind you of the important events. With the Auto layout function, you can create custom diaries that display information in the format you prefer. New features include automatic backup, a snooze button, the ability to turn off alarms while using specified applications such as modem software, and a choice of beep options. Multi-User versions are compatible with LocalTalk, MacServe, TOPS, allShare, PSN and Apple Share.
Single User DAC 0032 $64.
1-4 Users DAC0033 $125.
5-8 Users DAC0034 $189.



MacPro Plus (Key Tronic)
Key Tronic's new MacPro Plus keyboard is compatible with all Macintosh computers. The enhanced 105-key layout includes Period/Comma lock capability, an interchangeable Caps Lock and Ctrl keys. Also, the connecting cable you need is offered at no extra charge. The keyboard is backed by a limited lifetime warranty and unlimited toll-free product support. Includes offer for Tempo II, a keyboard macro package from Affinity Microsystems a $149.95 value FREE! **INP0083 $118.**

ACC0252	MacPlus/SE Carrying Case (black)	55.
ACC0250	MacPlus/SE- Ext Keyboard Carrying Case	69.
ACC0482	Premier Leather Case	175.

ACCOUNTING & PERSONAL FINANCE

Aatrix Software

FIN0050	Checkwriter II 3.1	32.
FIN0041	Payroll 3.5	109.
FIN0113	Ultimate Payroll	189.

Absolute Solutions, Inc.

FIN0086	Computerized Classic Accounting	225.

Checkfree Corporation

FIN0088	CheckFree	21.

ChipSoft

FIN0114	TurboTax Personal 1040	50.

Computer Associates

FIN0044	ACC PAC Bedford Simply Accounting 1.1	139.

Inman

BUS0016	Business Plan Tool Kit	99.
FIN0013	Business Sense 1.3	129.

Intuit

FIN0043	Quicken 1.5	35.

Meca

FIN0039	Andrew Tobias' Managing Your Money 4.0	135.

Nolo Press

BUS0133	For The Record 2.0	31.
BUS0132	WillMaker 4.0	37.

Peachtree

FIN0059	At Once!	285.

Reality Technologies

FIN0068	WealthBuilder (Mac)	145.

Softsync/BLOC Publishing

FIN0048	Accountant Inc. Professional	345.

Softview

FIN0090	if:X Personal Tax Analyst	59.
FIN0097	MacInTax 1040 - 90	59.

Teleware, Inc.

FIN0087	M.Y.D.B. 2.0	145.

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BUS0086	ResumExpert Cover Letters	49.
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BUS0109	Health Care	49.
BUS0102	Manager Edition	49.
BUS0103	Sales & Marketing Edition	49.
BUS0087	ResumExpert (Word 3.0/4.0 version)	49.

Abacus Concepts

STA0008	StatView II 1.03	279.
STA0010	StatView SE+Graphics 1.03	179.
STA0022	SuperANOVA (MacII Family)	309.

Abbott Systems, Inc.

BUS0131	Cheshire 1.0	63.

Acius

DAT0045	4th Dimension 2.1	489.

AEC Management Systems

BUS0129	FastTrack Schedule 1.5	139.
DAT0055	AEC Information Manager	409.

Aldus

BUS0066	Persuasion 2.0	329.

ASD Software, Inc.

BUS0134	Planisoft	195.
BUS0146	Planisoft - 5 pack	579.
BUS0147	Planisoft - 10 pack	839.

Ashton-Tate

DAT0042	dBase Mac	SPECIAL! 59.

PixelPaint Professional 2.0 (SuperMac)
Now uses virtual memory to open and scroll through large and multiple documents. Its new 8-bit masking tool permits semi-transparent masking from any brush, tool, or image. Wet Paint allows you to reposition and edit any shape or text after original creation. Image processing tools let you adjust color, contrast, and brightness. Many tools are now pressure-sensitive, so they work like real-world tools. PixelPaper lets you create textured canvases that simulate charocoal paper, concrete, linen, and slate. **GRA0249 $465.**

The "ULTIMATE" SE Carrying Case (I/O Design, Inc.)
The "ULTIMATE" SE Carrying Case is designed with the same high quality standards as other MacLuggage products. This case offers internal, padded compartments for ANY Macintosh keyboard, mouse, external hard disk and cables also holds the new Macintosh Classic. It also features 2 additional exterior pockets for everything from disks to umbrellas. Combine these features with sturdy Dupont Cordura nylon and 1/2 inch high density foam padding and you'll see why this is the "Ultimate" carrying case for your Mac. Available in black and navy blue. **$69.**

FREE!

The fifth edition of Steven Bobker's *Power User's Tool Kit* is now available exclusively to MacWAREHOUSE customers. A hand-picked collection of four powerful programs on one handy disk, the newest *Tool Kit* includes *To Do!*— a unique desk accessory for organizing and implementing your daily tasks. The newest version of *StuffIt Classic*, also on the disk, will create freestanding space-saving archives of files that you can expand whenever you need them without having any special decompression software.

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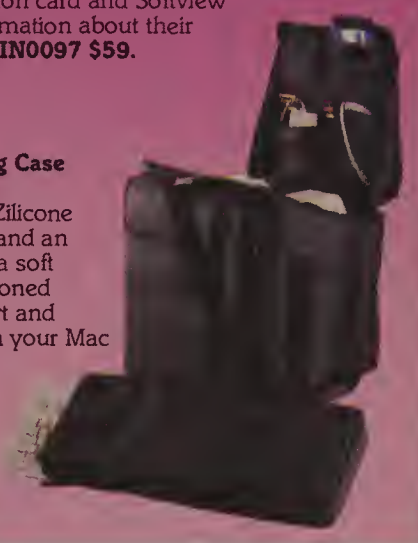
PhoneNET® Card for Ethernet (Farallon)
Enables Mac SE/30 or Mac II family computers to utilize the increased speed and band width of Ethernet. You attach the telephone cabling directly to your Mac—no external connector or transceiver is needed. The 10BASE-T compliant PhoneNET Card for Ethernet comes with Timbuktu software, which lets you share screens and transfer files with other Macintoshes running Timbuktu over any AppleTalk network.
NuBus MacII NET0089 $399.
Nu-Bus SE/30 NET0091 $399.
Nu-Bus 10-Pack NET0090 $3449.



MacPlus/SE- with Extended Keyboard Carrying Case (Targus)
Pamper your Mac with a Targus case made of Zilicone treated nylon to give you waterproof durability and an impact absorbing high-density foam layer with a soft protective lining for complete protection. Cushioned shoulder pad and handles provide extra comfort and convenience. There's room for everything from your Mac including the new Macintosh Classic, a hard disk drive, and the extended keyboard to pockets for your mouse, floppies, cables, and pens. **ACC0250 $69.** Full Mac line available in black. Some styles available in blue, burgundy, and platinum. Premier Leather Case available (black) **ACC0482 $175.**

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BUS0149 1 Shot Worksheet ..... 59.

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DAC0010 QuickDex ..... 34.

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BUS0135 Alarming Events ..... 85.
GRA0070 CalendarMaker 3.0 ..... 31.

Claris
DAT0064 FileMaker Pro ..... 218.
BUS0058 MacProject II 2.1 ..... 365.
BUS0065 SmartForm Designer ..... 289.

DeltaPoint, Inc.
BUS0099 DeltaGraph 1.5 ..... 109.

Fox Software
DAT0047 FoxBase+/Mac 2.0 ..... 292.

Informix
BUS0064 WingZ 1.1 ..... 245.

JAM Software
DAC0032 Smart Alarms 3.0 (Single User) ..... 64.
DAC0033 Smart Alarms 3.0 (1-4 users) ..... 125.
DAC0034 Smart Alarms 3.0 (5-8 users) ..... 189.

Kaetron
BUS0100 TopDown 2.0 ..... 229.

Mainstay
GRA0100 MacSchedule 2.5 ..... 139.
GRA0237 MacSchedule PLUS ..... 215.

Microsoft
BUS0003 Excel 2.2 ..... 245.
BUS0008 PowerPoint 2.01 ..... 245.
BUS0088 The Microsoft Office ..... 529.

Graflex (ICD)
Graflex connects your Mac to any printer with a Centronics-style parallel interface. Graflex emulates the ImageWriter II on most dot matrix printers, using a special cable with the adaptor interface built in. No bulky power supplies to drag around. Great for Mac Portable users, or anyone who travels with a Mac. **INP0095 $82.**

BUS0014 Works 2.0 ..... 199.

Portfolio Systems
BUS0101 Dynodex - The Instant Address Book ..... 75.
DTP0055 DynoPage ..... 57.

Power Up
BUS0096 Address Book Plus ..... 52.
BUS0073 Calendar Creator ..... 35.
BUS0121 FastForms 2.0 ..... 105.

Round Lake Publishing
BOK0007 LetterWorks ..... 59.

Satori
BUS0025 Bulk Mailer 3.2.5 ..... 75.

Softview (Full line available)
BUS0138 if:X Forms Designer ..... 175.
if:X Expense Reports ..... ea. 49.

Symantec Corporation
BUS0055 More 3.0 ..... 265.

Symmetry
BUS0075 KeyPlan ..... 245.

Synex
BUS0120 MacEnvelope Plus 2.0 ..... 159.

Timeslips
BUS0043 Timeslips III 2.0 ..... 195.

T/Maker
BUS0152 SmartBundle ..... 215.

Vertical Solutions
BUS0113 FastEnvelope ..... 45.
BUS0105 FastLabel 2.0 ..... 45.

Wolfram Research, Inc.
STA0013 Mathematica (SE) ..... 449.

Zedcor
BUS0118 DESK 3.03 ..... 229.

1990 NOMINEE MacUser

DiskDoubler 3.0 (Salient Software) Disk Doubler 3.0 compresses your files when you save them and expands them when you open them. It doubles your hard disk and floppy disk storage capacity. Works transparently within any application, and operates in the background under MultiFinder. Disk Doubler works with documents, applications, plus sound graphics, and scanner files. **UTI0179 $45.**

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EDUCORP
CDR0006 EDUCORP CD-ROM 4.0 ..... 159.
CDR0003 EDUCORP Clip Art CD ..... 45.
EDU0198 Lingua-ROM ..... 399.

Wayzata Technology
EDU0194 The World Fact Book ..... 79.

NEC
CDR0002 NEC Interface Kit ..... 72.
GRA0212 Photo Gallery ..... 246.
CDR0001 Intersect CDR-35 Reader ..... 399.

Microsoft
BUS0019 The Microsoft Office CD-ROM ..... 599.

COMMUNICATIONS & NETWORKING

Caravelle Networks Corporation
NET 0099 Mac to Mac - 5 pack ..... 165.
NET0100 Mac to Mac - 10 pack ..... 229.
NET0101 Mac to Mac - 50 pack ..... 979.

CE Software
COM0054 In/Out (5 user Pak) ..... 128.
COM0041 QuickMail 2.2 (1 - 10 users) ..... 315.

CompuServe
COM0040 Navigator 3.0 ..... 49.

DataViz
COM0001 MacLink Plus / PC 4.5 ..... 117.
COM0052 MacLink Plus / Translators 4.5 ..... 98.

Dayna Communications, Inc.
UTI0116 DOS Mounter ..... 55.

Farallon™ Computing
COM0078 Liaison 3.0 ..... 259.
NET0005 PhoneNET® 128/512 ..... 35.
NET0084 PhoneNET® Manager's Pack ..... 669.
NET0007 PhoneNET® Plus, SE & II ..... 33.
NET0040 PhoneNET® Plus, SE & II - 10 Pack ..... 219.
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NET0059 StarController™ EN (EtherNet) ..... 1629.
NET0058 Timbuktu® 2.0 - Remote Access Pack .. 845.
NET0038 Timbuktu® 3.1 ..... 95.
NET0034 Timbuktu Remote® 2.0 ..... 123.
PhoneNET® Card for EtherNet:
NET0089 Nubus Mac II ..... 399.
NET0091 SE/30 ..... 399.
NET0090 Nubus 10-pack ..... 3449.

FreeSoft
COM0060 White Knight 11 ..... 85.

Hayes
COM0015 Smartcom II 3.2 ..... 84.

Insignia
UTI0174 AccessPC ..... 65.
COM0063 Soft PC AT/EGA Module ..... 125.
COM0045 SoftPC 1.3 ..... 245.

International Business Software
NET0097 DataClub - 3 Pack ..... 199.
NET0098 DataClub - 10 Pack ..... 539.

Microcom
NET0041 Carbon Copy Mac - single ..... 117.
NET0088 Carbon Copy Mac - twin ..... 189.

Prodigy
COM0056 Prodigy Starter Kit for the Mac ..... 27.

Sitka
NET0056 InBox Plus 3.0 ..... 1299.
NET0057 DOSTOPS 3.0 ..... 165.
NET0049 MACTOPS 3.0 ..... 187.

Software Ventures
COM0043 Microphone II 3.0 ..... 215.

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NET0045 Lap-Link III - Connectivity Pac ..... 99.

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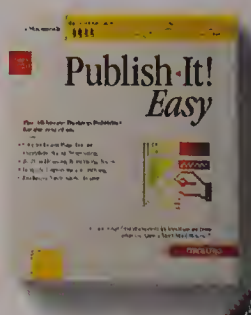

1990 WINNER MacUser

Publish-It! Easy
The All-in-one desktop publisher, you can write a document, check the spelling, mix type styles, add graphics, and print it all in a few simple steps, without ever leaving the program. Includes a 112,000 word spell checker and a 240,000 word thesaurus. **DTP0048 $145.**

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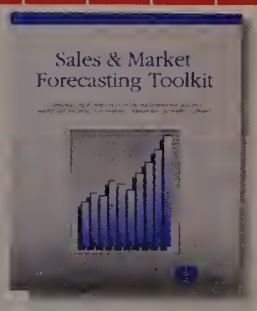

Business Plan Toolkit
If you need to write a business plan you need Business Plan Toolkit. *MacUser* gave the program 4.5 mice. Includes a sample plan on disk/paper complete with text, tables and graphs. Financial templates include all statements, forecasts, personnel plan and ratios. **FIN0116 $99.**

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Lets you use the full power of Microsoft Word 4.0 by taking the mystery out of style sheets. Displays and prints style settings and samples in beautifully organized windows and reports. Includes auto-formatting templates and dictionary of computer terms. **WRD0033 $51.**

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Design your home from a library of sample plans that calculate distances, diagonals, areas, and angles, then create the interior with a showcase of hundreds of furniture shapes arrangable in eight different views. When finished just print and begin building. **$65. ea.**

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DTP0056 Design Team ..... 889.
DTP0045 PageMaker 4.0 ..... 499.
DTP0047 PrePrint ..... 329.
Letraset
FDN0086 LetraStudio ..... 275.
Multi Ad Services
DTP0042 Multi Ad Creator 2.21 ..... 695.
Quark, Inc.
DTP0028 QuarkStyle ..... 189.
DTP0049 XPress 3.0 ..... 525.
Silicon Beach
DTP0040 Personal Press ..... 205.
TimeWorks
DTP0048 Publish It! Easy 2.0 ..... 145.

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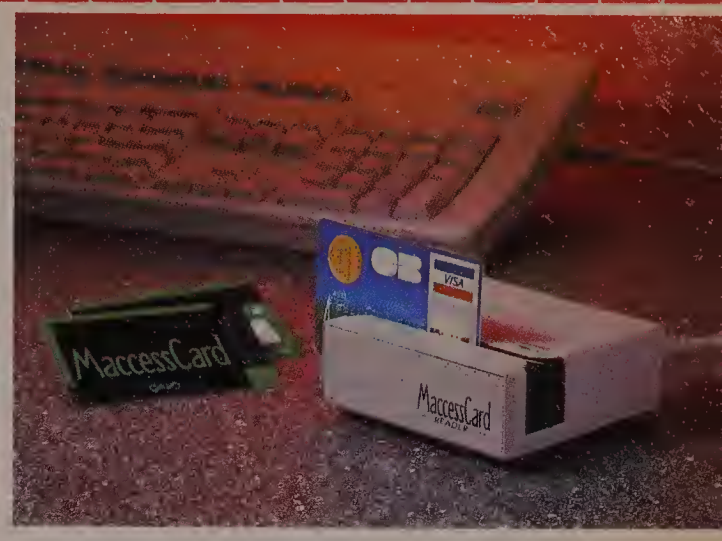
Applied Engineering
DRI0287 AE HD Mac Drive ..... 245.
INP0148 QuadraLink ..... 215.
Computer Friends
GRA0251 ColorSnap 32 Plus ..... 649.
Cutting Edge
DRI0042 800K Floppy Disk Drive ..... 149.
DRI0157 20 meg Under the Mac Drive ..... 319.
DRI0158 30+ meg Under the Mac Drive ..... 389.
DRI0162 45 Mb Removable Hard Drive (Syquest) 639.
DRI0159 45+ meg Under the Mac Drive ..... 429.
DRI0160 60+ meg Under the Mac Drive ..... 479.
DRI0161 80+ meg Under the Mac Drive ..... 529.
Dayna Communications, Inc.
DRI0174 DaynaFile dual 360K (5.25) & 1.44 (3.5) 749.
DRI0104 DaynaFile single 360K (5 1/4) ..... 499.
Fujitsu
DRI0186 800K Disk Drive - Fujitsu ..... 99.
Kennect Technology
DRI0218 Drive 1200 ..... 259.
DRI0141 Drive 2.4 ..... 329.
DRI0219 Drive 360 (5.25 in. floppy disk drive) ..... 259.
DRI0140 Rapport ..... 199.

MaccessCard Reader (ASD)
The MacessCard Reader requires FileGuard 2.5 software. The software can be configured so that without a registered MaccessCard or the combination of a MaccessCard and an access key, no one can gain access to your Mac. Cards packaged with the reader can be used or the system can be trained to recognize any ID card (Visa, company or student ID card). **ACC0539 $319.**



DRI0204 60 Meg External Hard Drive ..... 469.
DRI0205 80 Meg External Hard Drive ..... 519.

EDUCATIONAL & INSTRUCTIONAL

Beacon Technology, Inc.
HYP0034 HyperBible International Version 2.0 ..... 129.
HYP0035 HyperBible King James Version 2.0 ..... 129.
Broderbund
EDU0170 The Playroom ..... 29.
Davidson & Associates
EDU0037 Math Blaster 29
EDU0118 Math Blaster Mystery ..... 29.
Help Software, Inc.
EDU0108 Desktop Help for Excel ..... 52.
HyperGlot Software Company
Pronunciation Tutor w/ Sound:
Chinese, French, German or Spanish . ea. 39.
Tense Tutor:
French, German, Spanish or Italian ..... ea. 39.
Verb Tutor w/ Sound:
French, German, Spanish or Italian ..... ea. 39.
Word Torture: French, German, Italian, Russian or Spanish ..... ea. 29.
EDU0246 Easy Kana - Japanese ..... 129.
EDU0245 RefBase ..... 105.
Learning Company
EDU0084 Math Rabbit ..... 30.
EDU0048 Reader Rabbit 2.0 ..... 30.
MicroMaps
GRA0229 MapArt PICT Format ..... 99.
GRA0228 MapArt EPS Format ..... 99.
Nordic Software
EDU0142 MacKids Preschool Pack ..... 36.
Penton Overseas (Full line available)
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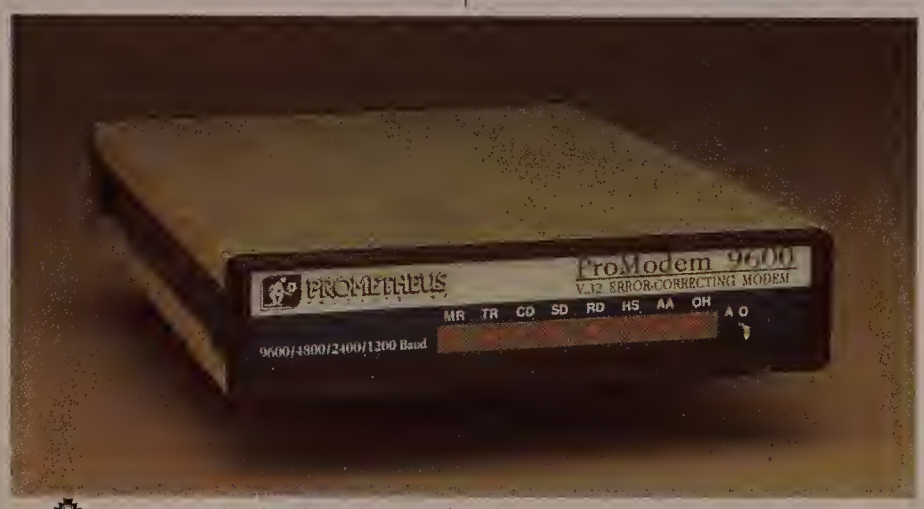
Visionary Software
EDU0207 LifeGuard ..... 49.
EDU0209 Synchronicity 2.5 ..... 49.
Voice & Video
Getting Started Video: Excel 2.2, PageMaker 4.0, Word 4.0 ..... ea. 39.
Advanced Techniques Video: Excel 2.2, PageMaker 4.0, Word 4.0 ..... ea. 39.
EDU0063 HyperCard Getting Started Video ..... 39.
Zondervan Publishing House
BOK0022 MacBible - Greek ..... 99.
BDK0021 MacBible - King James Version ..... 59.
BDK0020 MacBible - New International Version ..... 59.

ENTERTAINMENT

Artworx
ENT0303 Bridge 6.0 ..... 29.
Baseline Publishing
ENT0351 Talking Moose ..... 23.
Broderbund
ENT0259 Shufflepuck Cafe ..... 25.
Where is Carmen Sandiego? ..... ea. 29.
Bulls City Software
ENT0308 Moriarity's Revenge ..... 35.
Bullseye
ENT0045 Ferrari Grand Prix 1.6 ..... 31.
ENT0046 Fokker Triplane Flight Simulator 2.8 ..... 23.
ENT0261 P51 Mustang 2.80 ..... 35.
Centron Software, Inc.
ENT0329 BlackJack Strategy Tester (w/ BlackJack Ace) ..... 65.
ENT0277 Casino Master ..... 49.
ENT0289 Casino Master Deluxe Mac II Version ..... 55.
ENT0257 CrapsMaster ..... 27.
ENT0264 BlackJack Ace ..... 27.
Electronic Arts
ENT0355 Harpoon ..... 39.
ENT0319 Starflight ..... 39.



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9600M Plus Modem (Prometheus)
The Only V.32 Data Modem that gives you the ability to send and receive faxes using a 9600 Data Modem and a 9600 Send/Receive Group III Fax. Supports MNP-5 and V.42 error correction/V.42 bis data compression. Comes with MAcKNOWLEDGE (TM) communications software, Maxfax fax software program and many exclusive features, including grey scale support, on-line help, and the ability to import and export phone book data, plus a Mac cable. **MOD0052 $699.**

Mass MicroSystems
DRI0256 DataPak MD 512 MB Read-write/optical ..... 3425.
GRA0243 QuickImage 24 Video Frame Grabber - II 749.
Micron Technology
DRI0187 Xceed 8-bit Video Card NB6-48 ..... 349.
DRI0236 Xceed IIci - 128 Cache Card ..... 275.
MicroTech International, Inc.
DRI0294 Athena A100 100 Meg Drive ..... 899.
DRI0293 Athena A50 50 Meg Drive ..... 599.
DRI0311 Europa 100 Meg Drive ..... 739.
DRI0308 Europa 20 Meg Drive ..... 379.
DRI0309 Europa 40 Meg Drive ..... 419.
DRI0310 Europa 80 Meg Drive ..... 599.
DRI0307 MicroTech R50 50 Meg Removable ..... 979.
DRI0304 Nova N40 40 Meg Drive ..... 565.
DRI0305 Nova N80 80 Meg Drive ..... 745.
Optical Access International
DRI0251 Access CD ..... 849.
DRI0252 Access MF ..... 3995.
MED0036 Access MF Rewritable Dptical Cartridge 239.
Peripheral Land, Inc.
DRI0193 Infinity Dual 40Mb Removable ..... 1875.
DRI0115 Infinity Turbo 40 Meg Removable ..... 799.
DRI0154 Turbo Floppy 1.4 Drive ..... 359.
PowerUser™
DRI0201 20 Meg External Hard Drive ..... 329.
DRI0202 30 Meg External Hard Drive ..... 369.
DRI0206 44 Meg Removable ..... 629.
DRI0203 45 Meg External Hard Drive ..... 419.

LaserScript Printer (Abaton)
Solves printing problems for a mixed hardware office. It supports PostScript with a Microsoft/Bauer PostScript interpreter, and the HP LaserJet II PCL page printing language is resident. Also supports PostScript Type 1 fonts and Bitstream fonts, and has two slots for HP font cartridges. It has a LocalTalk port, plus RS-232 serial and Centronics parallel ports, so you can network it with all the computers in your office. Comes with manufacturer's one-year warranty with 90-day on-site service. **INP0130 $1999.**

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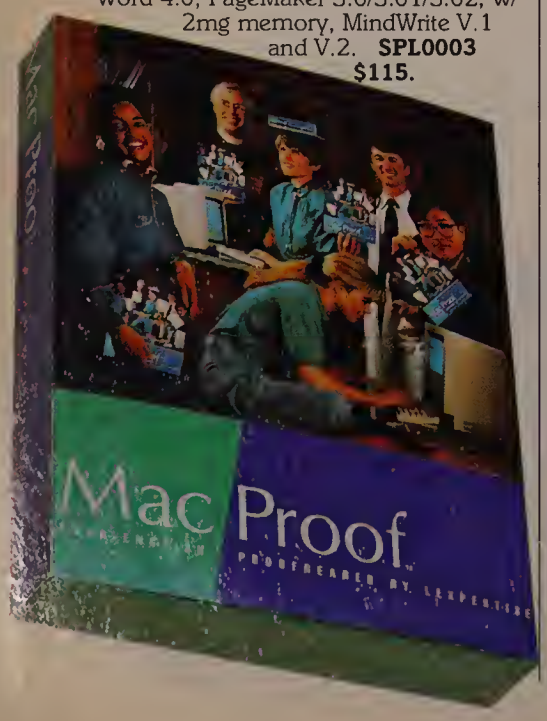
Atlas MapMaker 4.5 (Strategic Mapping)
A complete desktop mapping system that lets you quickly display the relationships in geographic data with striking color presentation graphics. Includes everything you need to map the U.S. by state or county, the world by country and much more. Use the U.S. Census statistics included with the program, or choose from a library of data and map files provided. Also read in Zip coded name and address files and display their map locations, or combine their data into useful information of target marketing, customer analysis, distribution planning, and sales-territory design. **GRA0227 $369.**

Sir Tech Software, Inc.
ENT0096 Wizardry ..... 35.
ENT0347 Wizardry II: Knight of Diamonds ..... 29.
Spectrum HoloByte
FACES, TETRIS, Welltris ..... ea. 25.
The Software Toolworks
ENT0281 Chessmaster 2100 ..... 32.
ENT0278 Life & Death ..... 32.
ENT0269 The Hunt For Red October ..... 20.
Three-Sixty
ENT0323 Sands of Fire ..... 32.
Toyogo
ENT0270 Go Master 4.7 ..... 45.

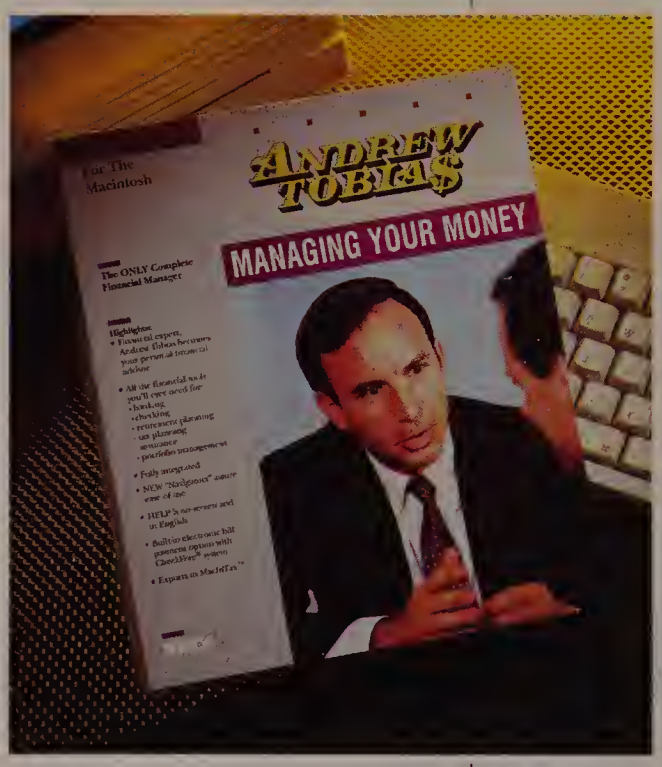
MacProof 3.2.1 (Lexpertise)
You'll never get a second chance to make a first impression! MacProof 3.2.1 is your English proofreader. Without leaving your document, it proofreads all text written on your word processor: business, educational, personal and professional. MacProof is a desk accessory for the Macintosh Plus, SE, II and IIcx. It checks mechanics, word usage, writing style and structure. You can customize the usage and spelling dictionaries to your specific requirements. Compatible with MacWrite II V. 1.0, MacWrite V. 4.6 & 5.0, Microsoft Word 4.0, PageMaker 3.0/3.01/3.02, w/ 2mg memory, MindWrite V.1 and V.2. **SPL0003 $115.**



ENT0326 Nemesis Deluxe ..... 95.
XOR Corporation
ENT0274 MacGolf Classic ..... 52.
ENT0330 MacSki ..... 40.
ENT0212 NFL Challenge ..... 55.

FONTS & APPPLICATIONS

Adobe Systems, Inc.
FON0264 Adobe Type Manager 2.0 ..... 55.
FON0278 Adobe Type Manager Plus Pack ..... 109.
Adobe Type Set 1 or 2 ..... ea. 58.
FON0326 Adobe Type Set 3 ..... 129.
Smart Art I, II, III or IV ..... ea. 59.
DAC0028 TypeAlign ..... 59.
FON0295 Adobe Type Reunion ..... 38.
Altsys
FON0183 Art Importer 2.0 ..... 95.
FON0014 Fontographer 3.2 ..... 275.
FON0284 Metamorphosis 1.5 ..... 95.
Broderbund
GRA0156 TypeStyler ..... 119.
Dubl-Click
FON0081 MenuFonts 3.0 ..... 31.
Pacific Data Products
INP0138 Pacific MacPage ..... 425.
QMS
UTI0169 UltraScript ..... 119.
Tactic Software
FON0265 ArtFonts ..... 50.
TeleTypesetting
FON0343 T-Script ..... 92.
FON0357 T-Script Basic ..... 55.



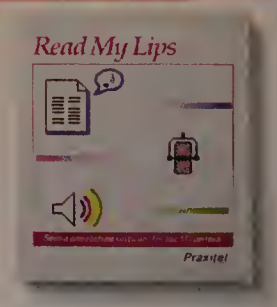
Andrew Tobias' Managing Your Money 4.0 (Meca Software)
NEW! The most innovative personal finance package available for the Mac. Packed with powerful features including REMIND which records important dates, appointments and projects. MONEY, the heart of the program, tracks income, writes and prints checks, manages credit cards, create budgets and more. TAX leads you easily through every corner of the tax law and determines your final bill. INVEST handles all stocks, bonds, options and mutual funds. **FIN0039 $135.**

GRAPHICS & MULTIMEDIA

3G Graphics
GRA0188 Images with Impact! Accents & Borders 1 65.
GRA0111 Images with Impact! Business 1 ..... 65.
GRA0089 Images with Impact! Graphics ..... 50.
Abraca Data
CAD0032 Design Your Own Home-Architecture ..... 65.
CAD0033 Design Your Own Home-Interiors ..... 65.
Adobe Systems, Inc.
DTP0054 Illustrator 3.0 (w/ ATM 2.0) ..... 349.
GRA0125 Streamline ..... 119.
GRA0191 PhotoShop ..... 499.
Aldus
GRA0090 Freehand 2.02 ..... 329.
Baseline Publishing
GRA0242 Color MacCHEESE ..... 59.
Bright Star Tech, Inc.
GRA0161 interFACE ..... 249.
Claris
CAD0029 ClarisCAD 2.0 ..... 649.
GRA0118 MacDraw II ..... 289.
GRA0117 MacPaint 2.0 ..... 92.
Creative Software
GRA0240 Easy Color Paint 2.0 ..... 47.
Deneba Software
GRA0075 Canvas 2.1 ..... 189.
GRA0187 UltraPaint ..... 125.
Dream Maker
GRA0105 Cliptures Vol 1 Business Images ..... 69.
GRA0124 Cliptures Vol 2 Business Images ..... 69.
GRA0219 Cliptures Vol 3 Sports ..... 69.
GRA0101 MacGallery (Hypercard version) ..... 27.
GRA0102 MacGallery (MacPaint version) ..... 27.
Electronic Arts
GRA0106 Studio/8 ..... 189.
GRA0231 Studio/32 ..... 449.

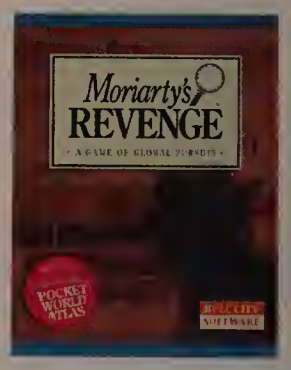
Farallon™ Computing
GRA0221 MediaTracks™ ..... 189.
GRA0222 MediaTracks™ Multimedia Pack ..... 319.
Graphsoft
CAD0024 Blueprint ..... 219.
CAD0030 MiniCAD+ 3.0 ..... 595.
Innovative Data Design
CAD0028 MacDraft 2.0 ..... 193.
GRA0104 Dreams 1.1 ..... 349.
Letraset
GRA0151 ColorStudio ..... 649.
DTP0019 ImageStudio 1.5 ..... 139.
MacroMind
GRA0140 MacroMind Director 2.0 ..... 439.
Metro Image Base
Full Line Available ..... ea. 85.
Paracomp
GRA0235 FilmMaker ..... 439.
GRA0233 Swivel 3D Professional ..... 439.
GRA0234 SwivelArt ..... 82.
Praxitel
UTI0211 Read My Lips ..... 75.
Preferred Publishers
GRA0239 Master Color ..... 99.
GRA0238 Master Paint ..... 50.
Silicon Beach
GRA0092 Digital Darkroom 2.0 ..... 259.
GRA0131 Super 3D 2.1 ..... 339.
HYP0027 SuperCard 1.5 ..... 205.
GRA0112 SuperPaint 2.0 ..... 135.
Solutions, Inc.
DAC0002 SmartScrap & The Clipper 2.01 ..... 56.
Strata
GRA0176 StrataVision 3D ..... 375.

Rapport, Drive 2.4, 360 &1200 (Kennect Technology)
Plug Kennect's New 5.25" Drives, Drive 1200 and Drive 360 into Rapport to read, write & initalize 1.2 Mb. or 360K MS DOS 7 Apple II 140K ProDOS. Drive 2.4, plugged into Rapport, is a 3.5" Diskette Drive which reads, write & initializes all Mac & IBM formats expands 800K diskettes to 1.2 Mb & High Density Diskettes to 2.4 Mb. Rapport alone enable older Macs to read 720K MS-DOS on the internal floppy drive or read & write 720K on an external Apple 800K Drive. **Rapport DRI0140 $199. Drive 2.4 DRI0141 $329. Drive 360 DRI0219 $259. Drive 1200 DRI0218 $259.**



Read My Lips
Attach sounds to documents you create using popular word processors, desktop publishing, and presentation software. Use pre-recorded sounds or record your own. Both the built-in microphones of the new Macs as well as MacRecorder are supported. **UTI0211 $75.**

Smartcom II 3.2
Specially designed to work with any Hayes modem, Smartcom II automates communications with Autopilots while providing a variety of error-free file transfer options. It holds informations for later use in a peruse buffer and stores frequently used instructions as programmable buttons. **COM0015 $84.**



Moriarty's Revenge
The infamous Dr. Moriarty is now a ranking leader of a world-wide crime organization and you must track him down. You'll travel the world puzzling over clues. Features over 1,000 clues and a computerized notebook for keeping them organized. **ENT0308 $35.**

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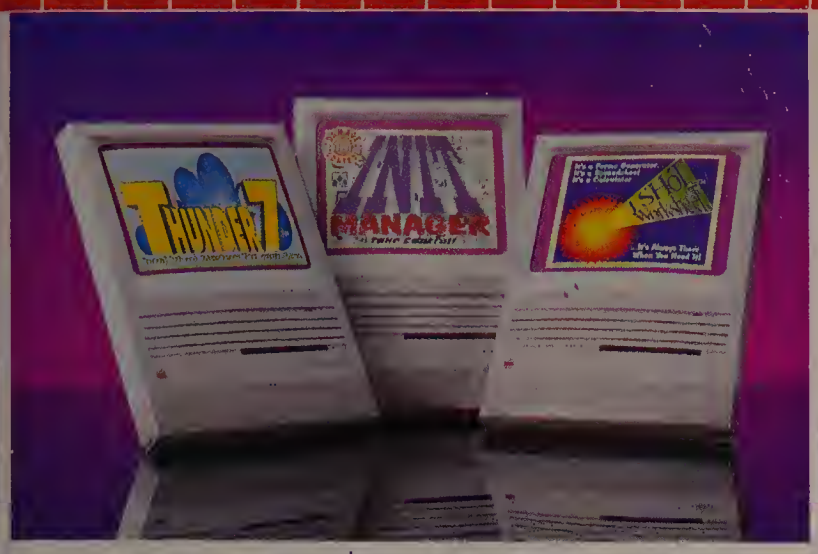
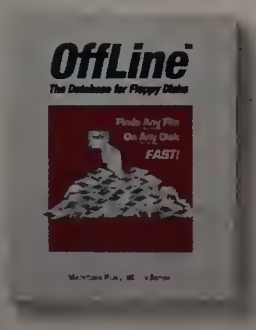


INIT Manager (Baseline)
Save sets of INITs, disable INITs, control statup icons, and generate reports. Includes a Damage Control feature to prevent recurring crashes. **UTI0187 $35.**
1 Shot Worksheet: Ideal for estimating, proposals, and amoritzation schedules. Combines a powerful forms generator and the mathematical capabilities of a spreadsheet. **BUS0149 $59.**
Thunder 7: Alerts you of spelling, capitalization and punctuation errors. Expands abbreviations and corrects frequent misspellings. Includes a 1.4 million word thesaurus. **SPL0029 $59.**

MacPrint 1.2
Easy-to-use software utility that lets you use most Mac applications with any HP LaserJet, DeskJet or compatible printer including the Series III. Prints text and graphics at the printer's maximum resolution, but does not support Postscript. Cable is included. **UTI0098 $95.**

Metro ImageBase Electronic Clip Art
Add power to your documents with fabulous art images from Metro ImageBase (R)! They make newsletters, presentations, reports and brochures communicate more effectively. Each of the eighteen ImageBase packages contains at least 100 topic-related images drawn by professional artists. **$85. ea.**



Off-Line
A complete disk management system that's easy to use. Unlike other disk utilities, OffLine was designed and optimized to manage floppy disks. Catalogs automatically, searches on multiple criteria, print disk labels and exports to other applications. **UTI0207 $51.**

Strategic Mapping, Inc.
GRA0227 Atlas MapMaker 4.5 ..... 369.
Studiotronics
GRA0189 Colorset 1.5 ..... 229.
SuperMac
GRA0109 PixelPaint 2.0 ..... 225.
GRA0249 PixelPaint Professional 2.0 ..... 465.
T/Maker Co.
GRA0209 ClickArt Business Cartoon ..... 33.
GRA0039 ClickArt Business Image ..... 32.
GRA0088 ClickArt EPS Illustrations ..... 82.
Zedcor
GRA0199 DeskPaint 3.3 ..... 115.

HARDWARE & PERIPHERALS

ASD
ACC0539 MaccessCard Reader ..... 319.
Caere
INP0143 Typist ..... 479.

CasinoMaster (Plus/SE) & Deluxe Mac II Version (Centron Software)
Let it Ride! You can bet on having hours of fun with Casino Master's five exciting casino games. Includes **Blackjack, Ace, Crapsmaster, Roullette Master, Pokermaster and Baccarat Master**. Exact table simulation, mouse controlled betting, selectable bankroll, stored win/lose statistics and complete manual included in full color! An odds-on favorite with professional gamblers. Individual games **$27** each./5 game **Casino Master Package ENT0277 $49. Deluxe Mac II version ENT0289 $55.**
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Includes **Free** copy of Black Jack Ace! Test your betting and playing strategies over thousands of hands. Card counting, 1-8 decks, 1-7 players. Develop a winning strategy, practice it with Casino Master or Blackjack Ace, then go off to the casino with confidence! **ENT0329 $65.**

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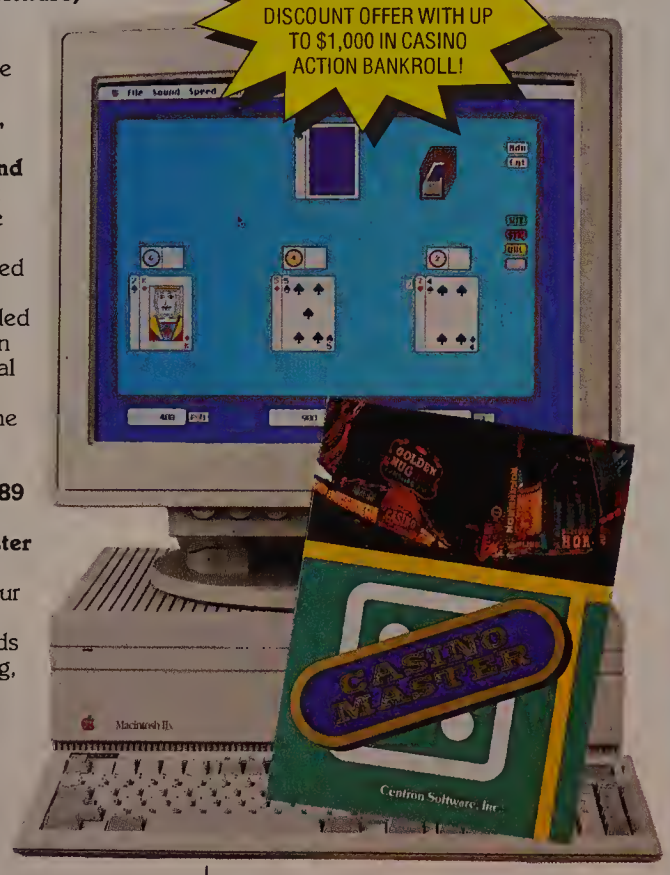
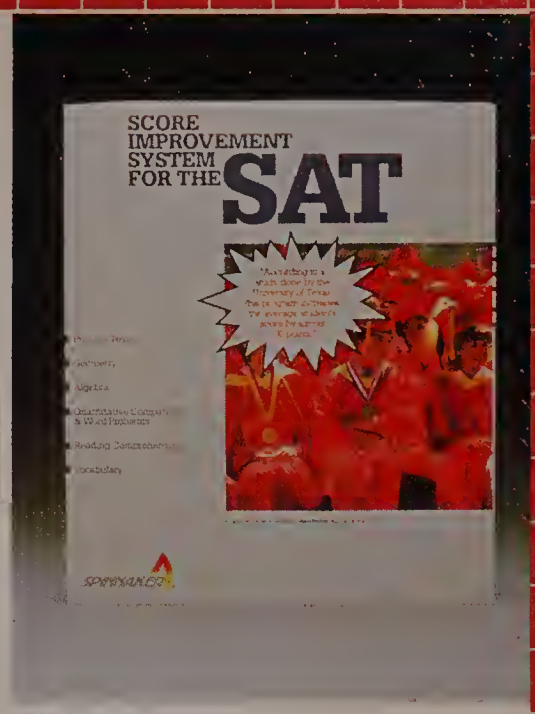


CoStar
INP0091 LabelWriter ..... 185.
Hewlett Packard
INP0096 HP DeskWriter - 2279A ..... 759.
MegaGraphics
MON0015 8-bit 19" Hi-Res Greyscale for Mac II ... 1879.
MON0016 8-bit 19" Hi-Res Greyscale for SE/030 . 1899.
MON0006 Rival System for Mac II ..... 1269.
MON0008 Rival System for Mac SE ..... 1269.
MON0007 Rival System for Mac SE/30 ..... 1269.
Seikosha
INP0041 Seikosha SP 2000 AP Printer ..... 235.
Sharp
COMP007 Wizard OZ 7000 (32KRam) ..... 229.
COMP018 Wizard OZ 7200 (64KRam) ..... 255.
ThunderWare
INP0116 LightningScan 400 ..... 385.
INP0007 ThunderScan Plus ..... 199.

Mac-to-Mac (Caravelle Networks Corporation)
Offers direct file transfers over any AppleTalk network, including multiple zones, without a server. Increases workgroup productivity by allowing Macs on a network to quickly and simply send or retrieve files to and from one another. All smoothly in the background with no work disruptions. Excellent security options, transaction log. User list automatically maintained. Easy to learn and use. Also, provides two-way text conferencing and answering machine capabilities. **5-Pack NET0099 $165. 10-Pack NET0100 $229. 50-Pack NET0101 $979.**

INPUT & OUTPUT

Abaton
INP0130 LaserScript Printer ..... 1999.
Calcomp
INP0102 The Wiz Pen ..... 57.
INP0098 The Wiz Tablet ..... 159.
CH Products
INP0121 RollerMouse ADB ..... 75.
Datadesk International
INP0097 DataDesk Switchboard ..... 159.
INP0047 Mac 101 Keyboard SE/II ..... 129.
Digital Vision, Inc.
GRA0145 Computer Eyes B & W ..... 199.
GRA0154 Computer Eyes For Mac-Color ..... 349.
ICD
INP0095 Graflex ..... 82.
Kensington
NP0059 Turbo Mouse ..... 109.
INP0060 Turbo Mouse ADB (SE or II) ..... 109.
Key Tronic
INP0083 Key Tronic Mac Pro Keyboard ..... 118.



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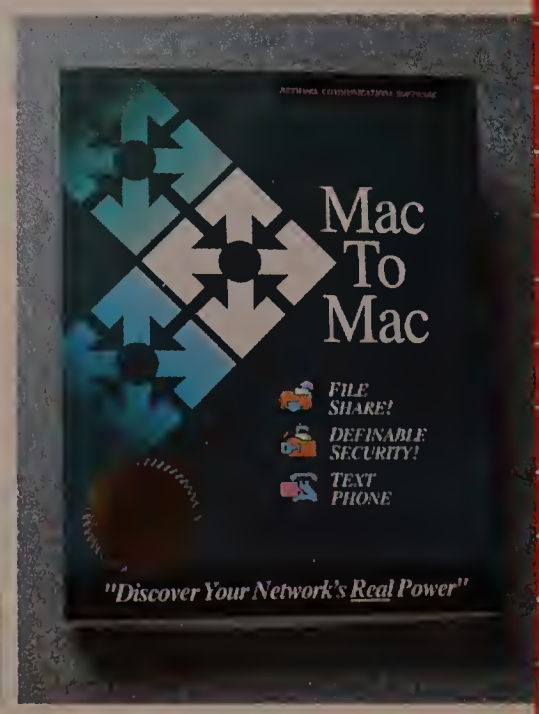
Helps college-bound high school and prep school students learn how to take the College Entrance Examination Board's Scholastic Aptitude Test (SAT). No need to tremble before the dreaded exam, when you can learn about it in advance. The tutorial section explains each question and the logic behind the correct answer. And before you take the real SAT take the Practice Exam. Covers both the Math and Verbal sections. **EDU0161 $29.**

Koala
INP0127 MacVision 3.0 ..... 269.
Kraft
INP0094 Kraft ADB Trackball ..... 79.
Kurta
INP0113 IS/ADB Tablet 8 1/2 x 11 ..... 319.
INP0114 IS/ADB Tablet 12 x 12 ..... 385.
INP0115 IS/ADB Tablet 12 x 17 ..... 625.
Microspeed
NP0126 MacTRAC ADB ..... 75.
INP0140 MacTRAC DB9 ..... 62.
MicroTouch
INP0084 The UnMouse ..... 189.
Mouse Systems
INP0132 Little Mouse ADB ..... 75.
INP0134 Trackball / ADB ..... 69.
Sophisticated Circuits
ACC0535 Power Key ..... 65.

MEMORY UPGRADES & ACCELERATORS

1 MEG SIMMs Low profile, 100ns, High Quality ..... 59.
Daystar Digital
DRI0224 FastCache IIci ..... 289.
DRI0288 PowerCache - 40 MHz (IIci) ..... 979.
DRI0290 PowerCache - 50 MHz (IIci) ..... 1699.
PowerCard 030 ..... starting at 1495.



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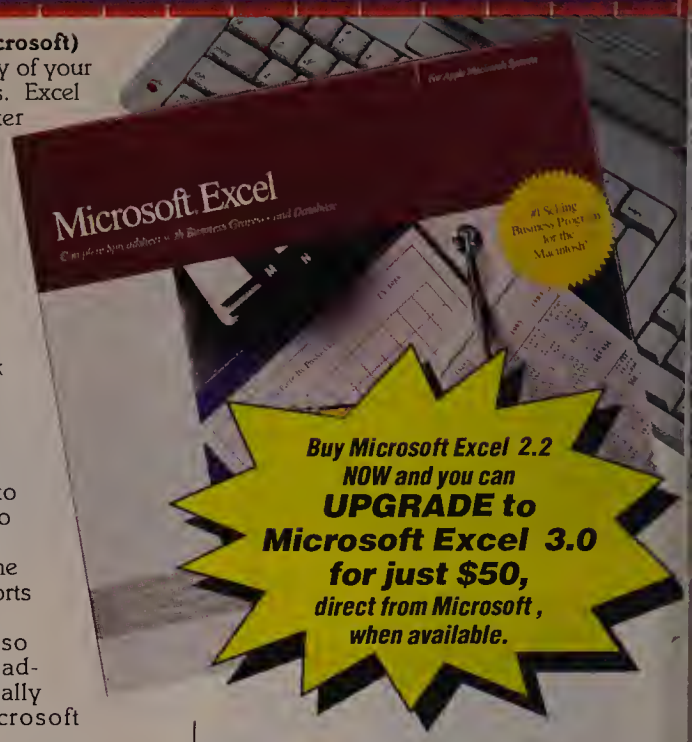
TelePort, the ADB Modem (Global Village Communication)
The perfect choice for powerful yet compact Mac communication. This 2400 baud modem with MNP5 data compression packs Hayes compatibility and error-free communication. TelePort plugs into your mouse (ADB) port and provides a pass-through connector for other devices. It uses no external power supply, and leaves your serial port free for other uses! **MOD0049 $129. TelePortFAX includes SendFAX software.** Hold OPTION as you drag FILE-PRINT to easily send FAXes worldwide **MOD0058 $189.**

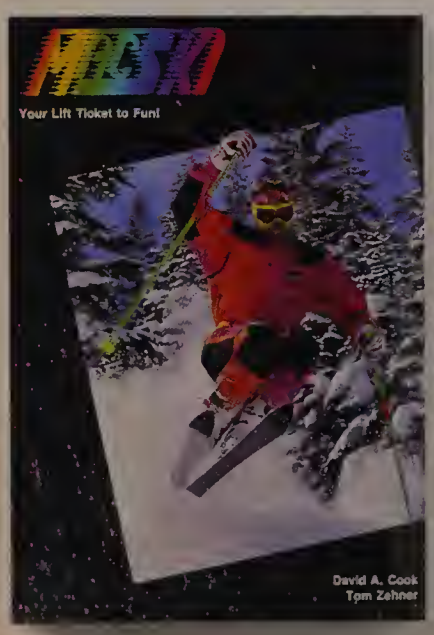
Microsoft Excel 2.2 (Microsoft)
Now use the full memory of your Mac—up to 8 Megabytes. Excel 2.2 recalculates 40% faster while empty cells consume no memory at all. Cell annotation lets you add notes to any cell and auditing functions help you trace cell references. The new Search and Replace function makes global changes. Just doubleclick anywhere on a chart to see the dialog box for all the chartformatting commands. Charts are now dynamically linked to the original worksheet, so the chart automatically reflects any changes in the spreadsheet. Also supports "warm links" to Microsoft Word 4.0, so changes to your spreadsheet data automatically appear in your Microsoft Word documents.
BUS0003 $245.



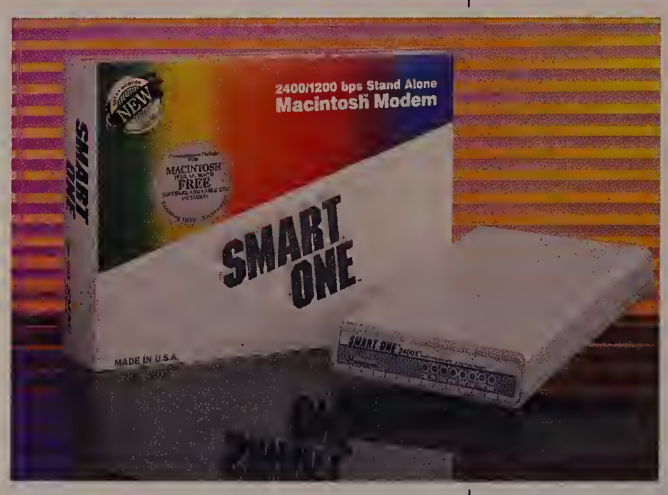
Connectix
UTI0144 Virtual 030 UM3 ..... 115.
DRI0185 Virtual 2.0 PMMU ..... 188.
Dove
DRI0130 MaraThon 030 (MacII) w/Virtual ..... 529.
DRI0198 MaraThon 030 - (Mac SE) w/ Virtual ..... 529.
DRI0197 MaraThon 030 - (MacPlus) w/Virtual ..... 529.
DRI0152 MaraThon 030X (MacIIx) w/ Virtual ..... 529.
DRI0151 MaraThon 030-SE/030 w/ Virtual ..... 529.
Micron Technology
DRI0321 PicturePress Card (Xceed ICDP-II) ..... 745.
MicroTech International, Inc.
CHP0025 Mac Classic 1 Meg Upgrade ..... 99.
CHP0026 Mac Classic 3 Meg Upgrade ..... 175.
DRI0315 Mac Classic Upgrade Kit 20-1 ..... 399.
DRI0317 Mac Classic Upgrade Kit 40-1 ..... 499.
DRI0318 Mac Classic Upgrade Kit 40-3 ..... 575.
PowerUser
CHP0013 1 Meg Simm 100ns PowerUser ..... 59.
Total Systems
DRI0295 Mercury 16MHz 68030 - Plus ..... 499.
DRI0297 Mercury 16MHz 68030 - SE ..... 389.
DRI0299 Mercury SCSI Module - Plus ..... 189.
Gemini- Full Line Available
DRI0301 Gemini 20 MHZ Card ..... 799.
DRI0302 Gemini 25 MHZ Card ..... 1039.
DRI0265 Gemini Plus Kit ..... 129.

MODEMS & FAX

Abaton
MOD0019 InterFax 12/48 ..... 265.
MOD0034 InterFax 24/90 ..... 349.
Applied Engineering
MOD0054 DataLink/Mac ..... 209.
Best Data Products
MOD0021 SmartOne 2400/1200 ..... 139.
Dove
MOD0038 DoveFax Desktop ..... 299.
Global Village
MOD0049 TelePort ..... 129.
MOD0058 TelePort/Fax ..... 189.
Hayes
COM0023 Smartmodem 2400 ..... 349.
MOD0017 Smartmodem 9600 (V series) ..... 719.
MOD0060 Personal Modem 2400 w/Smartcom II ... 179.
Microcom
MOD0050 MacModem V.32 / 9600 ..... 689.



PowerUser™
MOD0043 PowerUser 2400 ..... 99.
MOD0047 PowerUser Mini Send Fax 2400/9600 .... 149.
MOD0051 PowerUser Send/Receive Fax Modem 2400/9600 ..... 279.
Prometheus
MOD0046 ProModem 2400 Maxfax ..... 309.
MOD0052 9600M Plus Modem ..... 699.
MOD0033 Promodem 2400 MFax ..... 209.
MOD0035 TravelModem ..... 199.



SmartOne 2400/1200 (Best Data Products)
When you need a 2400 baud modem, the SmartOne 2400/1200 provides an economical alternative. For less than the cost of some 1200 bps units, you get a Hayes compatible modem with auto answer/originate, 300, 1200, and 2400 baud operation, pass-through phone jack, speaker with programmable volume, and a manufacturer's two-year warranty. All user options are stored in non-volatile memory. Includes free Quicklink II communications software, modem, cable, and **CompuServe/Prodigy Start-Up Kit offer. MOD0021 $139.**

Shiva
NET0067 NetModem V.32 (9600) ..... 1395.
Supra Corporation
MOD0020 SupraModem 2400 ..... 119.

MUSIC & SOUND

Altech Systems
MUS0032 ALTECH MIDI Interface ..... 59.
Coda Music Software
MUS0044 Finale 2.5 ..... 549.
Electronic Arts
MUS0004 Deluxe Music Construction 2.5 ..... 85.
Farallon™ Computing
MUS0036 MacRecorder® 2.0 ..... 159.
Opcode Systems
MIDI Translator ..... 43.
Tactic Software
Sound Clips Vol. 1, 2, 3 & 4 ..... ea. 50.

SECURITY & VIRUS PROTECTION

ASD Software, Inc.
UTI0135 FileGuard 2.5 ..... 139.
UTI0130 FileGuard 2.5 - Office Pack 5 ..... 349.
UTI0131 FileGuard 2.5 - Office Pack 10 ..... 579.

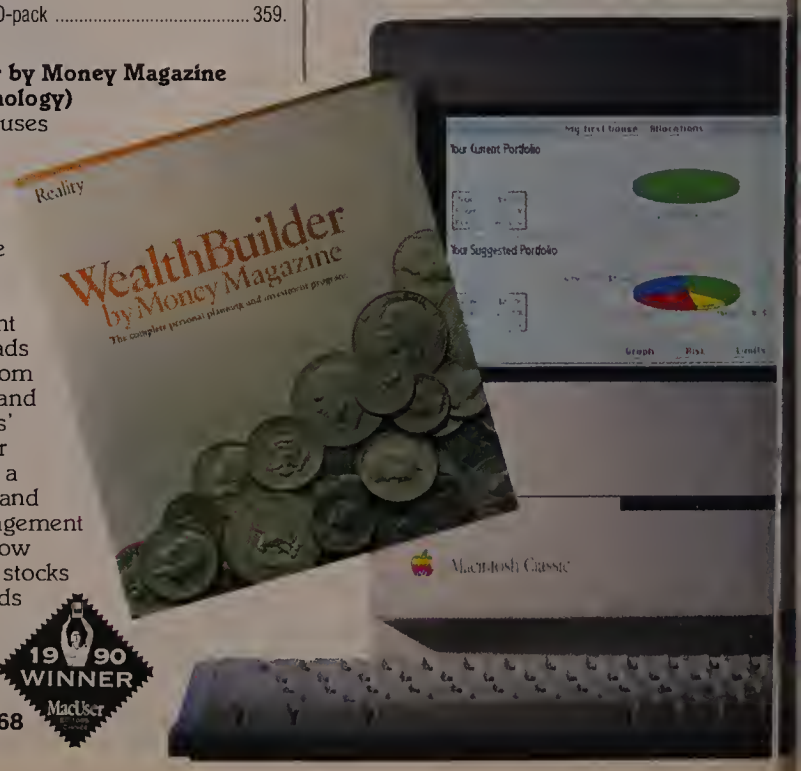
MacSki (XOR)
Hit the slopes in sound and color with this challenging skiing simulator. Pick your skiing ability and choose your course. There are 20 different and challenging layouts from which you can select, or you can design your own. The program allows up to 256 different combinations of difficulty level, snow condition, visibility, and wind speed. **ENT0330 $40.**

GAME HALL OF FAME MACWORLD 1990

Fifth Generation System
UTI0120 DiskLock ..... 118.
Kensington
ACC0235 Apple Security Kit ..... 34.
PassProof ..... 70.
Kent Marsh
UTI0028 MacSafe II ..... 107.
UTI0064 NightWatch 1.03 ..... 86.
Microcom
UTI0093 Virex 2.9 ..... 59.
UTI0150 Virex 10-pack ..... 359.

WealthBuilder by Money Magazine (Reality Technology)
WealthBuilder uses your financial data and your decisions about goals and acceptable risks to calculate the best investment strategy. It reads data directly from both Quicken and Andrew Tobias' Managing Your Money. It has a stock tracking and portfolio management system, and now includes 5000 stocks and 5000 bonds from Standard & Poor's, in addition to 1450 mutual funds. **FIN0068 $145.**

1990 WINNER MacUser



Symantec Corporation
UTI0149 Symantec Antivirus for the Mac 2.0 (SAM) 67.

UTILITES & PROGRAMMING

Abbott Systems, Inc.
UTI0113 CanOpener ..... 64.
Aladdin Systems
UTI0145 StuffIt Deluxe ..... 63.
ALSoft
UTI0132 DiskExpress II 2.04 w/MultiDisk ..... 57.
UTI0110 MasterJuggler 1.5 ..... 57.
American Power Conversion
UTI0133 Power Chute ..... 69.
Baseline Publishing
UTI0187 INIT Manager ..... 35.
Berkeley System Design
UTI0119 After Dark 2.0 ..... 24.
CE Software
UTI0188 Quickeys 2 v.2 ..... 99.
Custom Applications
UTI0136 Freedom of Press 3.0 ..... 255.
UTI0185 Freedom of Press Light 3.0 ..... 56.
Dantz Development
UTI0118 Retrospect ..... 148.
Digitalk, Inc.
LNG0036 Smalltalk/V MAC ..... 125.
Dubl-Click
UTI0194 ClickChange ..... 41.
Fifth Generation Systems
UTI0063 FastBack II 2.5 ..... 118.
UTI0087 SuitCase II 1.2 ..... 49.
UTI0035 SuperLaserSpool 2.02-Single User ..... 93.
ICOM Simulations, Inc.
UTI0084 On Cue ..... 35.
Insight Developement
UTI0098 MacPrint 1.2 ..... 95.
Magic Software
UTI0077 Autosave II ..... 28.

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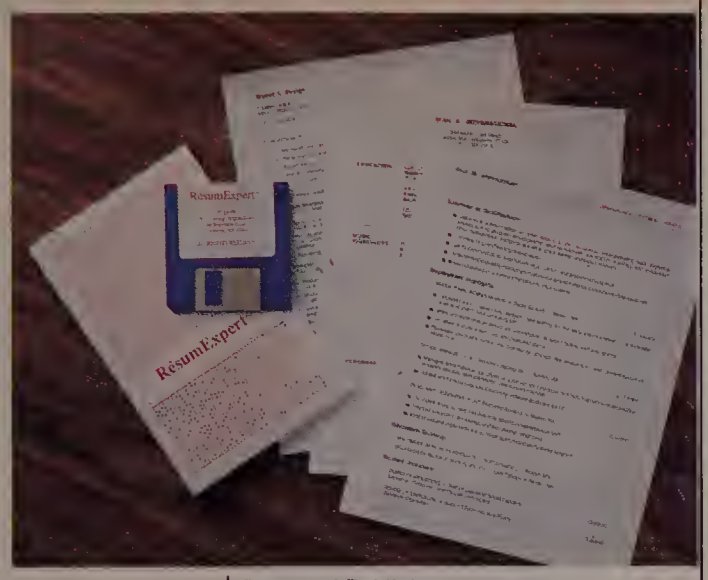

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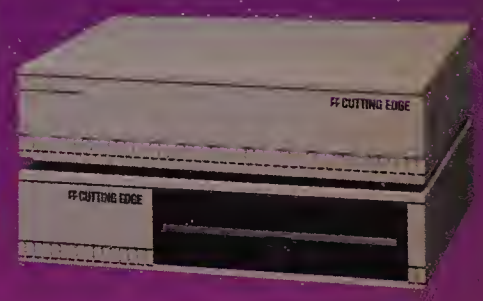

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NuTek Computers founder Benjamin Chou is confident that his company's chip set, operating system, and user interface will serve as the basis for a thriving Macintosh-compatible market.

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SEND IN THE CLONES

Since the introduction of the Macintosh, people have wondered IF there would ever be a Macintosh-compatible computer. More recently, the question has become WHEN will we see the first Mac-compatible?

Nu Tech (408) 973-8857 P.O. Box 161056 Cupertino, CA 95016-1056

IF THE LATE JANUARY ANNOUNCEMENT by two-year-old start-up NuTek Computers is any indication, Apple's quiet Macintosh monopoly may soon give way to a noisy host of Mac compatibles. According to NuTek president Benjamin Chou, the Cupertino, California–based company has developed three components—a chip set, an operating system, and user interface software—necessary for a fully functional Mac-compatible computer. NuTek's marketing strategy will involve licensing its products to select original equipment manufacturers (OEMs) that will build the actual computers.

Equipped with the NuTek operating system and user interface software, the new computers should run all well-behaved, 32-bit, clean Macintosh applications and work with nearly all the standard NuBus add-in boards and peripheral devices available from Apple and third-party vendors. NuTek claims the resulting machines will offer users enhanced features at lower prices than Apple's Macintosh machines. We speculate, for example, that buyers will be able to purchase a Mac-compatible with a color monitor, hard drive, and a 68030 processor for just over $600. NuTek expects OEMs to make the first Mac-compatibles available by the end of the year. (NuTek's Motif interface will be the first NuTek component available to the public, offering Mac owners an alternative desktop environment.)

Getting working products to market within a year will be a daunting task given the technical and legal problems facing NuTek. NuTek engineers have spent two years developing an operating system that is functionally equivalent to the current Macintosh Operating System and are in the process of distilling their chip set down to three chips. Testing for software and hardware compatibility is currently under way. Also, like any developer attempting to create the functional equivalent of Apple proprietary technology, NuTek must take every precaution to guarantee that the new code will be significantly different from Apple's. Although

NuTek has been scrupulous about following clean-room techniques throughout the development process, the company may still find itself involved in costly battles with Apple's legal department (see "NuTek's Legal Strategy").

It Happened to IBM

Designing a personal computer that is fully compatible with another personal computer is nothing new, as evidenced by the huge variety of IBM PC–compatible computers on the market. Barely a year after IBM introduced the original IBM PC in 1981, several vendors—including Compaq Computer—were shipping IBM PC–compatibles.

According to Michael Spindler, chief operating officer of Apple, "It is not a question of whether Apple will license its operating system, but how it will do this."

Compaq had written a legal version of the IBM ROM basic input/output system (BIOS)—the part of the operating system that allows DOS software to work with the Compaq hardware design. IBM had licensed PC-DOS from Microsoft; Microsoft subsequently licensed its version of the operating system, MS-DOS, to all comers—including Compaq.

In 1984, Phoenix Technologies developed and licensed its first IBM-compatible BIOS to Tandy Corporation. Phoenix's willingness to license its ROM BIOS to all prospective manufacturers enabled any vendor to develop PC-compatibles—without having to write its own ROM BIOS. The number of vendors and PC-compatible computers exploded. In fact, Phoenix claims that more installed PC-compatibles contain Phoenix ROM BIOS (over 14 million systems in 1989) than IBM BIOS.

Manufacturers of PC-compatibles, however, still had to design their own hardware to match that of IBM. That situation changed in 1985 when Chips and Technologies introduced a chip set that reduced the IBM PC AT logic board to five chips. Designing a PC-compatible became simple: buy the chip set and the ROM BIOS, and license the operating system.

Hard Hardware Issues

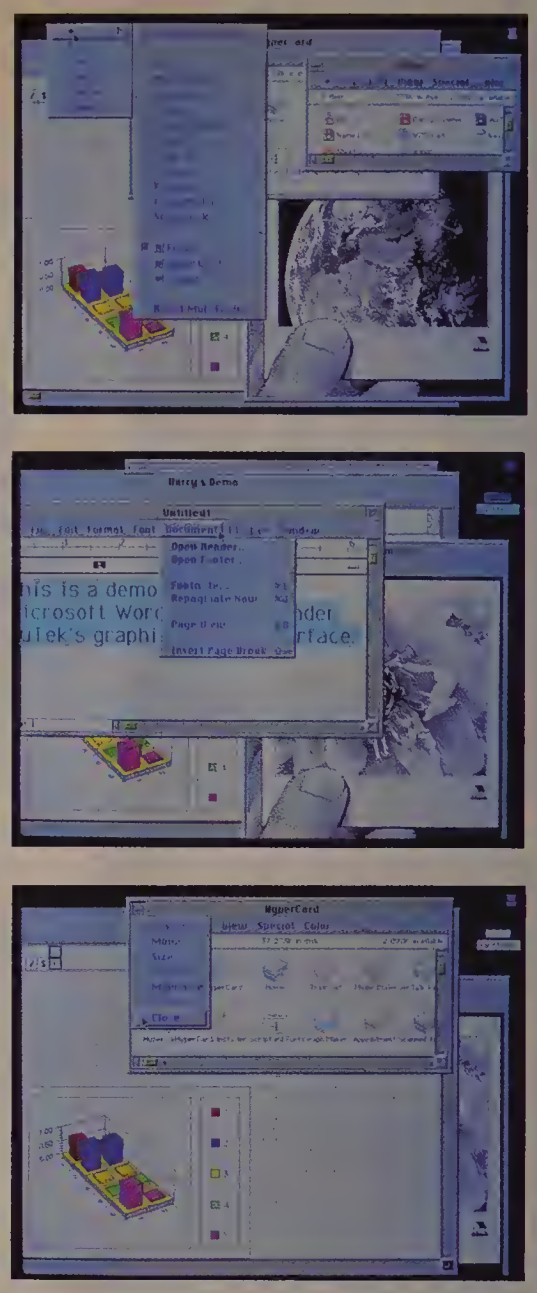
The original IBM PC, XT, and PC AT were built with off-the-shelf components and chips, easily accessible to any potential manufacturer. The basic component of all Macs is Motorola's 680X0 CPU family, which anyone can buy. In contrast, Apple's strategy has been to keep the hardware design of the Mac proprietary by constantly replacing off-the-shelf components on the Mac's main logic board with custom-designed, application-specific integrated circuits (ASICs).

According to NuTek, its three chips provide virtually all of the logic required to create a Mac-compatible computer. Two of the very large scale integration (VLSI) ASIC chips provide a NuBus-compatible interface to a standard Motorola 680X0-family processor, as well as memory-management circuitry. The third handles all the I/O peripheral control.

In addition, NuTek's chip set includes all the logic necessary for controlling floppy disk drives, including SuperDrives. NuTek says that its chip set implements Apple's non-standard versions of SCSI and NuBus and that any computer built with the NuTek chip set will work with most standard peripheral devices—disk drives, printers, video boards, network adapter boards, and the like.

NuTek has also designed its chip set to support high-performance features currently not available for all Macs—burst-mode memory transfers from the microprocessor, a capability that could improve performance of memory-intensive Mac applications, and direct memory access (DMA), currently available only on the Mac IIfx. All computers built with the NuTek chip set will be able to generate stereophonic sound, something the Classic, Plus, SE, and earlier Macs cannot do. All will support color. Finally, the chip set will address up to 64MB of main memory, twice that of current Macs, and will interface the CPU to the NuBus at speeds up to 33MHz.

Because the Apple Desktop Bus (ADB) technology is patented by Apple, NuTek will use a standard Intel 8742 chip to directly connect PC-compatible input devices to the I/O ports of a NuTek chip set–based computer.



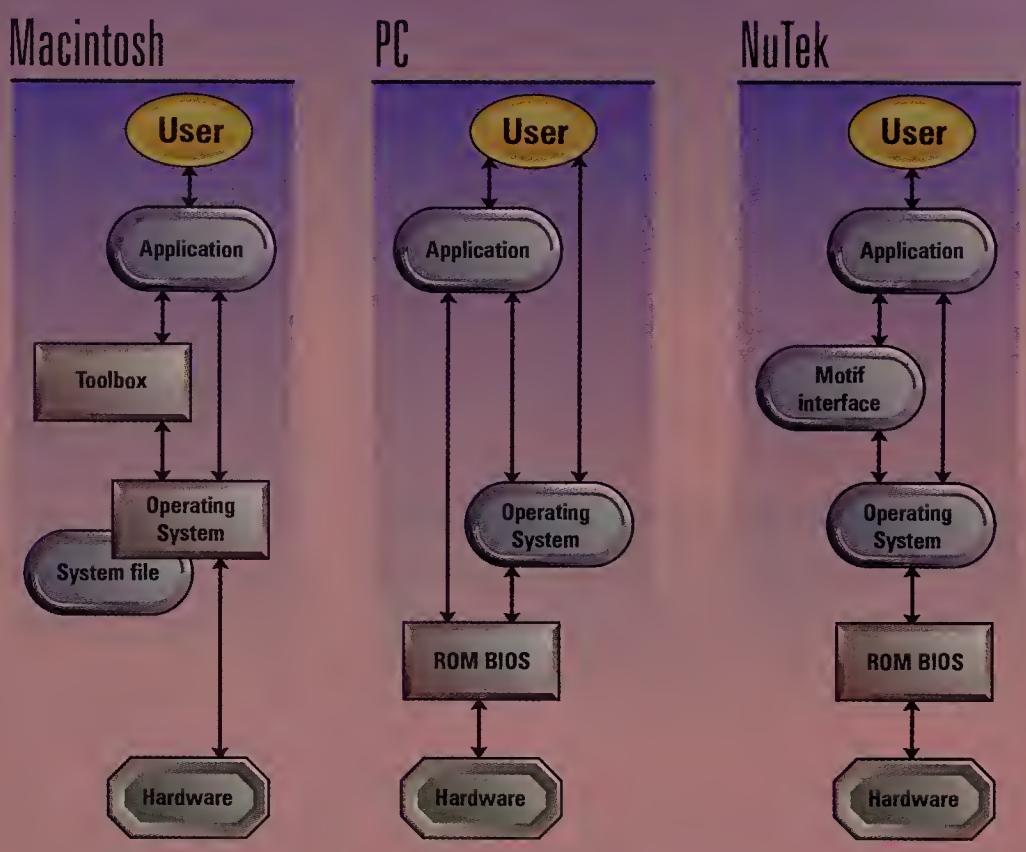
DRAKE SOREY

Although the two are similar, there are some noticeable differences between NuTek's Motif interface and the Mac interface. Buttons, menus, and scroll bars have a three-dimensional look. The main Finder menu pops up when you click on the desktop, with choices in hierarchical menus (top). Instead of being anchored to the top of the screen, application menus—such as this one from Microsoft Word—travel between active windows (middle). Click in the upper-left-hand corner of any window and a Control menu appears (bottom). The Control menu allows you to size and close windows; reduce, or minimize, the window to an icon; restore a window to its previous size; and maximize a window to take up the whole screen.

Will They Buy?

By developing an operating system, user interface software, and chip set that constitute a relatively compatible Mac system, NuTek could find itself in the enviable position of being not only the Phoenix Technologies, but also the

System Architectures Compared



The Macintosh Operating System and User Interface Toolbox are contained in read-only memory (ROM) chips on the Mac's main logic board. (The System file on disk is actually a resource file necessary for the Mac Operating System to function.) Basic start-up information for the computer—available hard drives, floppy drives, and so on—is also contained in ROM. Among the Mac Operating System's responsibilities are memory management, serial- and ADB-port control, and disk input/output. The Toolbox is responsible for the Mac's user interface—the way windows, pull-down menus, dialog boxes, and the like appear on the Mac screen. Applications (even the Finder is an application) use Toolbox routines to draw the screen and use the Operating System to talk to Mac hardware.

In the PC, a basic input/output system (BIOS) located in ROM is responsible for *bootstrapping* the system into action at start-up. After testing itself, the ROM BIOS searches for an operating system on any floppy disks or hard drives attached to the PC. The BIOS then loads the operating system—for example, MS-DOS or Windows—from disk. PC applications use the operating system and ROM BIOS to communicate with the PC hardware.

NuTek's system scheme for a Mac-compatible computer has more in common with the PC than the Mac—NuTek's operating system is disk-based like MS-DOS, not ROM-based like the Mac Operating System. A 64K start-up ROM BIOS controls power-on self-test functions and then bootstraps the operating system from a floppy disk or hard drive. NuTek's user interface is based on a rewrite of the Open Software Foundation's Motif graphical user interface, which is a collection of software routines on disk. By keeping the majority of the operating system in software, NuTek can more easily update its operating system to keep pace with changes not only in Apple's operating system but also in future hardware technology.

Chips and Technologies of the Mac-compatible market. The rewards could be enormous.

Phoenix Technologies, for example, initially licensed its ROM BIOS to hardware manufacturers for $10 per machine; if 1000 machines using its ROM BIOS were shipped by the hardware manufacturer, the manufacturer paid Phoenix $10,000. At its peak, Chips and Technologies made $200 million per year selling chip sets. Total the figures, and NuTek's two-year stake in developing the operating system, user interface software, and chip set is more than a good investment—it's a great one. As long as there are no extraordinary legal fees, that is.

All of this depends, of course, on whether hardware OEMs are willing to license NuTek's technology. Certainly, the precedent set by sales of PC-compatibles is enticing to any prospective vendor of Mac-compatibles. IBM-compatible computers from Compaq Computer, NEC Corporation, Toshiba Corporation, and others, currently account for more than 60 percent of a worldwide market estimated at more than $20 billion in annual sales. Worldwide sales of Macs are currently estimated at $4.5 billion a year—and it's all going into Apple's coffers. Tandy Corporation, for one, has expressed interest in selling Mac-compatible computers.

But hardware OEMs shouldn't overlook other issues. Signing on with NuTek requires considerable confidence in NuTek's technology and its ability to keep pace with Apple's system developments—both hardware and software. Even more, it requires confidence in NuTek's ability to stay in business should Apple decide to litigate. According to Chou, NuTek is willing to indemnify any hardware OEM from possible lawsuits filed by Apple regarding the NuTek operating system, user interface software, and chip set.

NUTEK'S LEGAL STRATEGY

According to legal experts, any company that wants to build a Macintosh-compatible computer needs three things: a detailed legal blueprint for avoiding Apple's intellectual property rights, scrupulous documentation of its independent development effort, and buckets of money to defend itself in court. NuTek Computers may be the first company to meet all three requirements.

In compatibility cases, there are user interface–copyright issues, software code–copyright issues, and patent issues. Some Mac software, such as the user interface and the operating system inscribed in ROM chips, is copyrighted, while some Mac processes, such as QuickDraw's region-clipping procedure, are patented. (According to Apple, there are more than 60 patents on the Macintosh; NuTek claims the U.S. Patent Office lists fewer than 25.) A copyright protects the expression or description of an idea but not the idea itself, while a patent generally protects any useful, innovative invention, process, or machine.

"The key is who is going to dare to be the first one to build a Mac clone, the person willing to go out and take some arrows in the back."

NuTek sidestepped the user interface–copyright issue by licensing the Motif interface from the Open Software Foundation. (Motif is based in part on New Wave, a user interface from Hewlett-Packard that Apple claims infringes its copyright. But as a licensee, NuTek is not responsible for any resulting legal issues if Apple should win its suit against HP.) Still, significant software code–copyright and patent issues remain.

In the early 1980s, IBM PC–compatible makers employed *clean-room* procedures to convince courts that the makers had no access to IBM's code and that they independently developed their products. Clean-room procedures vary; one setup is described in *Software, Copyright, and Competition* (Quorum Books, 1989). As described by author Anthony Lawrence Clapes, a group of experienced analysts study the target program to determine its functions and then write a detailed specification explaining how the program must perform, but not indicating how the code should be written. The company then hires programmers who have not had any previous contact with the target program. The programmers work only from the list of specifications, while the company maintains an audit trail of documentation, including mistakes made along the way, as evidence that the programmers' work is original.

NuTek roughly duplicated that process under the tutelage of G. Gervaise Davis III, a respected computer-copyright specialist with Schroeder, Davis & Orliss of Monterey, California. NuTek developed its operating system software and chip set by carefully looking at the design of the Macintosh and at publicly available documentation such as the *Inside Macintosh* series of books. Then, NuTek claims, its team of engineers duplicated the Macintosh's function by using newer technology and different processes. The company refused to hire former employees of Apple, in an attempt to avoid trade-secret issues; did a worldwide search for Apple's existing patents; and archived its weekly source-code development. According to Davis, a "person who should know" compared the resulting code with Apple's original and said the two are significantly different. And none of Apple's patents are infringed, according to Davis, who says NuTek's algorithm for graphic region-clipping, for example, differs significantly from that of Apple.

Even if NuTek has done all its legal homework, it may still be vulnerable if Apple sues. Since patents that have not been issued are not made public, Apple could conceivably have some pending applications that NuTek would have no way of knowing about. One attorney, however, thinks that is unlikely. "It's reasonable to assume that any hardware or any patentable aspect of the original Macintosh that isn't patented by now probably is not going to be," says Ron Laurie, who heads the Computer Law Group of Irell & Manella in Menlo Park, California.

So the patent issue involves a calculated gamble. What about copyright? "If you're building a compatible product, you've got to look at something," according to Laurie. "You cannot independently create a compatible product—it's an oxymoron." NuTek looked at *Inside Macintosh,* which doesn't have any code in it. Still, Apple might argue that *Inside Macintosh* has a high-level description of the program and that by looking at it NuTek infringed Apple's copyright. Laurie, however, doesn't think that would be a good argument.

As a practical matter, if Apple does sue, NuTek will bear the burden of proving in court that it did not infringe Apple's copyrights, patents, trademarks, or trade secrets. "Courts, like most people on the street, think that it's not nice to exploit the fruits of somebody else's labors," says Stephen J. Davidson, a Minneapolis attorney who specializes in computer technology issues.

ROBERT HOLMGREN

The U.S. intellectual property system does not give an absolute monopoly to any company, no matter how many patents or copyrights it has, according to NuTek's attorney, G. Gervaise Davis III.

NuTek should be able to counter that bias by showing how much time, money, and effort went into independently developing the Mac compatible. That way, according to Davidson, "you can go to the court and say, 'Look, these people didn't rip off something Apple had done, these people invested a zillion dollars and

a lot of hours and a lot of blood, sweat, and tears in developing a competitive product.' "

NuTek likes to compare itself to Compaq, the pioneering IBM PC–compatible maker that made a bundle off its compatible machines. Apple isn't convinced. A spokesman for the company would not comment specifically about NuTek, but notes that when it comes to the Macintosh, "there are copyrights, trademarks, and patents that do not relate to Intel-based clones."

In the absence of a business arrangement, he says, "there are no legal Macintosh clones or compatibles. We believe that you cannot clone a Macintosh without violating our intellectual property and, as you know, Apple aggressively defends its intellectual property."

NuTek hopes to avoid litigation but is prepared to go to court. "This company is funded by a group of investors who understood from the beginning that litigation might be a problem," says NuTek's attorney, Davis. An expensive problem according to attorneys, who estimate that the "burn rate" for this kind of litigation could be several million dollars per year for both Apple and NuTek.

Apple could decide not to sue NuTek but to go after any hardware company that builds Macintosh-compatible machines based on NuTek's products. "If Apple gets really litigious, they can scare a lot of the market away," according to one source, who asked not to be identified. "The key is who is going to dare to be the first one to build a Mac clone, the person willing to go out and take some arrows in the back."

NuTek hopes to protect its potential customers by indemnifying them against potential litigation by Apple. No one knows if that will be enough to reassure hardware companies and actually spur a new market, but there's plenty of speculation. "This is potentially an earthshaking development, not only in the industry but also in the Mac market," says Davidson. "If these people have done this right, I expect they'll be sitting on a gold mine."
—Deborah Branscum

If Apple does sue, NuTek's survival may lie not in its ability to prove that no infringement occurred, but in its ability to pay legal fees. NuTek investors include Chou, private sources in the United States, and one offshore investor, Lao-Yeo Hsu. Hsu is the chairman of Taiwan-based Ban Yu Paper Mill Company, a paper manufacturer that had pretax profits of over a billion dollars in 1989. According to 1990 Ban Yu Paper Mill figures, the company has approximately $100 million in available capital.

See How They Run

Even if NuTek can overcome legal hurdles and sell its chip set to computer vendors such as Dell or Tandy, software issues still present a major technical obstacle. Many software vendors are skeptical that NuTek can deliver on its promises of compatibility. The first IBM PC clones claimed complete compatibility but, more often than not, did not run major software packages correctly. The ROM in the early PCs contained only 16K of instructions; newer Macs use 512K ROM chips. "Apple's ROM and its system software are extremely complicated," says Joel West, president of Palomar, a vendor of software drivers for printers and plotters. "If they've failed to duplicate even one small quirk then there could be real compatibility problems for the user."

NuTek claims, however, that any software that follows Apple's specifications—and that doesn't address hardware directly—will run on the NuTek chip set. For the user, that means that all major applications, such as word processors, spreadsheets, and databases, should run correctly. Several games, such as Dark Castle, won't run, however—these programs frequently bypass Apple's managers in order to eke out the most performance they can. Applications that make direct calls to video hardware, such as HyperCard and Autodesk's AutoCAD, will not work either. And serial printers such as the Hewlett-Packard DeskWriter, GCC Personal LaserPrinter II, and Apple LaserWriter IISC may not work.

"When I hear 'mostly compatible' the hair on my head raises," says Dick Skeie, president of CE Software. "I know how tough it is to keep up with Apple's systems. We follow Apple's rules and regulations when we develop software and things still break on new systems." Chou admits that NuTek has not implemented all of the Mac's calls. What no one currently knows is which calls NuTek has implemented and what those calls do.

ROBERT HOMGREN

Gordon Campbell, president and CEO of Chips and Technologies, a company that successfully sells PC-compatible chip sets, feels that fear of Apple lawsuits will keep smaller vendors out of the market.

If current versions of Mac software won't run on the NuTek chip set, vendors will modify their applications to run—but only if the Mac-compatible machines are selling in volume (for vendors, that means thousands of units per month). But for most vendors, the question of whether or not they will modify software is a moot point. Most believe that Apple will litigate and that NuTek will not be able to withstand that legal onslaught.

At the same time, the software community is pulling for the underdog. Most hope that the appearance of viable Mac-compatibles will force Apple to be more aggressive with its technology. Adobe Systems, a company that has felt the sting of clone makers, agrees that a challenger can only be good for the industry. "I can speak from experience," says John Warnock, president of Adobe. "[Clone technology] has made us more competitive and made us raise the bar on the level of our technology to stay ahead of others. Apple won't be able to be complacent any longer."

Warnock believes that the problems inherent in porting Mac applications to run under Motif would be minor. "I would make such an investment," he says.

Who's Got the Clones?

Unlike NuTek, most companies have no desire to confront Apple with their own version of the Mac's ROM. Instead, they develop clever methods of working around the legal hurdles Apple has set up. Three such companies—Cork Computer, Hydra Systems, and RDI Computer Corporation—are developing Mac compatibility in very different ways for different uses.

Cork Computer's Cork System 30 is an inexpensive ($2999) IIci-equivalent system that requires a 128K ROM from a monochrome Mac. Cork says that it developed a color ROM that adds the functions of 32-bit QuickDraw without infringing Apple's copyright. The market for the product will be owners of monochrome Macs who want to upgrade to color systems inexpensively.

As Adobe's president John Warnock puts it, "There are two choices [for Apple]. Either stand and defend your turf, or be creative and stay ahead."

RDI's Companion is a $1695 combination of hardware (including a ROM from a Macintosh Classic) and software that lets Mac software run on RDI's Brite Lite, a SPARC-based laptop. Users will be Mac owners who want a powerful laptop but don't want to leave their Mac software behind. The company plans a software-only Mac emulation that will be faster and less expensive. Because RDI's Brite Lite has its own screen-drawing routines, it does not have to emulate QuickDraw.

Hydra Systems' product is a $995 add-in board for IBM PC XTs, PC ATs, and compatibles that lets those systems run monochrome Mac software. (Hydra's board now requires a Mac ROM chip.) Hydra licensed the Xerox Star interface to avoid legal problems with Apple. Of the three companies only Hydra says it is working on a clean-room approach to cloning the Mac's ROM. Hydra hopes to finish that project in about a year, after which its board would not need the Mac ROM.

Changing Times for Apple

For the ten years that Del Yocam was an executive at Apple Computer, he had a stock reply to any question about what Apple would do if someone attempted to clone its machines. Essentially his answer was that the company would spend up to its last remaining penny litigating to protect Apple's technology. Given Apple's lawsuits in the past, no one doubts the earnestness of his statements.

Times may have changed. The attorney who led Apple's Pyrrhic suits against Microsoft and Hewlett-Packard has left Apple. But Apple's most common response to companies trying to clone its hardware or software has been to wield its mighty financial and legal weight against those involved.

Franklin Computer was the first notable company that Apple successfully sued. Digital Research lost the lawsuit brought against it by Apple for infringing the copyright on Apple's interface and suffered substantial damage, although it remains in business. Cadmus, a Massachusetts-based workstation company, demonstrated Mac applications running on its workstations in 1986. Apple quietly acquired that company, which over time disappeared from sight. Outbound Systems, which like Dynamac and Colby, uses Mac ROM chips for its portable, seems to have gotten a little too good. Like Cadmus, Outbound is now entangled in a confidential and complex agreement with Apple.

Clearly, Apple's consistent strategy has been to bring lawsuits to protect its rights as soon as products such as these are brought to market. This suggests that NuTek and others are in for legal action.

DRAKE GOREY

Wendell Brown is president and CEO of Hydra Systems, a maverick company offering DOS-users an add-in board that lets PCs and PC-compatibles run monochrome Macintosh software.

ROSA LAU

Chuck Colby, president of Colby Computer and a pioneer in the Mac-compatible market, argues that if Apple hadn't guarded its ROMs so carefully, the Mac market might be three times its current size.

Market Share Is the Focus

During 1989 and 1990 John Sculley took a beating from the press, analysts, users, and vendors for neglecting to increase Apple's share of the personal computer market. Sculley seems to have taken these criticisms to heart. Expanding the Mac's installed base has become increasingly important in Apple's strategic thinking. Sculley's belief that the company had to produce cheaper computers for a mass market is verified by the Mac Classic's wild success.

Market-share growth is now a guiding principle in the thinking of Apple executives, but Apple's ability to manufacture more machines is saturated—the company is up to four shifts at its plant in Singapore. Apple cannot increase its speed without diminishing profitability on products that already have lower profit margins than any computer the company has manufactured to date.

Licensing the Mac OS

Another request has been that Apple license its operating system to third-party manufacturers. This would create a larger set of developer opportunities, expand the number of Macintoshes sold in the personal computer market, and therefore increase Apple's market share. By late 1990 Apple executives were rec-

onciled to the concept. According to Michael Spindler, chief operating officer of Apple, "It is not a question of whether Apple will license its operating system, but how it will do this."

Apple will have no difficulty finding partners to manufacture Macs. The difficulty lies in finding a partner pliable enough to adhere to all of the restrictions that Apple desires, restrictions that leave the development of technology in the hands of Apple while distributing the work of selling Macs to its licensed resellers. Apple has already experienced what it is like to lose technological leadership with its own machines—the bitter struggle with Adobe over type and printing technology is a recent example. This suggests Apple will eventually pick as a partner either a company too big and lethargic to develop a computer technology of its own (perhaps not even a computer manufacturer) or a smaller company that Apple can dominate.

Apple Views NuTek

On the surface, Apple appears placid about NuTek's announcement. Behind this facade lies a sophisticated strategy. Apple works nonstop to keep the lid on responses regarding potential competition and to prevent the company's executives from being seen as bad guys when Apple takes its possible competitors to court. Internally the reaction of Apple staffers to the NuTek announcement is an incredulous, stunned disbelief.

Big as Apple is, the company must recognize that in the face of a determined competitor, Apple cannot stop a clone any more than IBM could. At the moment, however, company spokespeople will not even admit that there is any similarity between what Compaq, Phoenix, and Chips and Technologies did in the IBM PC market and what NuTek and others may eventually achieve in the Mac market.

Once the OEM manufacturers of Macintosh-compatibles are announced, Apple can be expected to adopt a fall-back position; that is, to claim that customers will want a true Macintosh because only Apple (or its authorized licensees) can provide access to breakthrough technology. And there may be veiled allusions to compatibility problems with clones.

What Happens to Apple after Clones?

Apple will have an increasingly difficult time trying to reconcile growing research and development expenditures with declining profit margins. Competition from Mac-compatibles will dictate that Apple lead the market via technology rather than via marketing. Apple may begin to lose very profitable segments of its own market, such as peripherals.

While the company has stiff competition from peripheral vendors at present, it can be expected to become worse. Over time the Apple logo will be no more important in the mass market than the IBM logo.

ED KASHI

In the wake of NuTek's announcement, Michael Spindler, Apple's chief operating officer and president, must decide whether it's better to own the whole Mac pie, or a slice of a larger Mac-and-compatibles pie.

As Mac-compatibles begin to proliferate, prices will tumble. The second piece of Apple's business to crumble will be the stranglehold on the market channel it has through the authorization of dealers. Suddenly Apple-authorized dealers will face competitors selling Macintosh capability at 30 percent to 50 percent less. Mail-order vendors will introduce compatibles at cutthroat rates, taking away even more Apple revenues, and constricting the amount of money Apple can dedicate toward future products.

Apple Operating System Is the Key

It is easy to predict that the Mac market might duplicate IBM's, with compatible vendors actually producing higher-performance computers for less money. The big difference, of course, is that Apple writes its own operating system while IBM licenses its operating system from Microsoft.

The question, then, is can Apple continue to lead its market, with its own operating system, after the release of Mac-compatibles? It should come as no surprise that Apple has yet another version of its operating system under way, a non-QuickDraw version. The company could introduce this new operating system in order to chill competition, but a new operating system is likely to require a major change within the Mac installed base, and such an introduction might only increase the confusion.

On the other hand, NuTek is already saying that it will not write software to emulate the Mac's 7.0 operating system until 7.0 has been shipping for some while. Yet another version of the Mac OS could be a hurdle that compatible manufacturers might not overcome.

Reuse fee?

What's It All Mean?

NuTek is gambling that it has enough engineering expertise to unravel the Macintosh's complex environment; that the company has mitigated potential legal hassles by carefully adhering to classic clean-room development techniques; and that the company has the financial clout necessary to withstand any litigation that might ensue anyway.

Manufacturers of NuTek-based machines will have to gamble that buyers are willing to trade less-than-perfect software and hardware compatibility for lower prices and a few enhancements. And these companies will have to trust that NuTek will in fact indemnify them should Apple choose to sue.

The real concern for Macintosh users and developers should be how Apple responds. As Adobe Systems' president John Warnock puts it, "There are two choices [for Apple]. Either stand and defend your turf, or be creative and stay ahead. In this day and age standing in some intractable stance—a defensive position—is doomed to failure." ■

Written by ***Jerry Borrell, Brita Meng, Tom Moran, Cheryl England Spencer,*** *and* ***Suzanne Stefanac.***

What do the winners of the

The Secrets of the Super

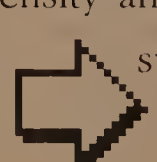
If every book in a bookstore looked the same, browsing wouldn't have the excitement and pleasure that any bibliophile knows. It's the same with stacks. More than 400 stacks and projects arrived at *Macworld* in time for the 1990 SuperStacks contest. To say that none of them looked alike is the understatement of the year. At the end of the three-week judging process, developers of 30 entries—which ranged in content from an animated dancing mouse to a simulation of an acute heart attack—emerged as SuperStacks winners.

What distinguished these stacks? From their opening cards, they cried out "Read me!" So, we did. Something about each of them reached out and grabbed us, took us in, and wouldn't let us back out until we'd explored

every last nook and cranny. The winning stacks all share excellence in interface design, informational organization, graphic design, and media integration. But more than that, they're fun to use. **Know Your Audience** SuperStacks winners designed their stacks to communicate specific information to a well-defined audience. The Earthquake Preparedness Stack, winner for Best Educational Entry, K–12, teaches that through knowledge and planning, you can improve your chances of surviving a big earthquake. Developer Kelly O'Brien compiled scanned graphics from public domain sources and material from at least 30 different periodicals and books to create a compelling interactive stack.

To avoid overwhelming her target audience of schoolchildren, O'Brien divided the stack into six chapters. Chapters include earthquake geology, scientific measurement, and home and office preparedness; each can be used as a separate lesson. And instead of presenting card after card of text, she chose graphics to explain and amplify short text fields of information.

For instance, you can explore ways to make your own home safer by clicking on bulleted hot spots—basement, kitchen, and bedroom—in a cutaway drawing of a house. Another card lets you interactively compare the intensity and magnitude of famous earthquakes, such as the 1985 Mexico City earthquake, mea-



suring 8.1 on the Richter scale, and the 1989 Loma Prieta earthquake, measuring 7.1.

1990 SuperStacks contest know that the rest of us don't?

"Kids Can Save the Earth"
Try large user groups (BMUG) (415) 549-2684

Stacks

by Liza Weiman

KAREN KUEHN

Students at the Thunderhill Elementary School in Columbia, Maryland, demonstrate some earth-saving techniques from Kids Can Save the Earth—this year's winner for Best Entry for under $20.

Organize Your Information

Clear and simple organization of information was the hallmark of the Motion Works' Outdoor and Vacation Adventure Guide. Winner for both Best International Entry and Best Interface Design, this guide to the vacation spots of British Columbia turns a 78-page booklet created by the Wilderness Tourism Council of British Columbia into a fun interactive jaunt with Eddie, an animated character, as your tour guide (see "Eddie Goes on Vacation").

Designed for novice HyperCard users, the Outdoor and Vacation Adventure Guide makes sure you're never lost. There is a central, well-organized table-of-contents card. Buttons are consistently placed along the bottom left of each card. And throughout the stack, Eddie's always there—just like a reliable guide. He arrives by helicopter at the beginning of the stack, snaps tourist pictures (never getting the one he wants), climbs mountains, and sits before a fire at the end of a long day. If you pause for long, Eddie taps his foot. Pause longer, and he tells you how to click on a button for more help.

Each branch of the stack contains information about a particular kind of vacation, say scuba diving, canoeing, or trekking and mountaineering, and then shows available resorts on a map of British Columbia. Once you finish exploring a branch, you can return to the table of contents. The Outdoor and Vacation Adventure Guide leads you through a series of sequential cards in an orderly way, but still leaves some room for creative exploration and roaming. (You don't have to read about *all* the fun stuff to do in British Columbia.)

ORAKE SOREY

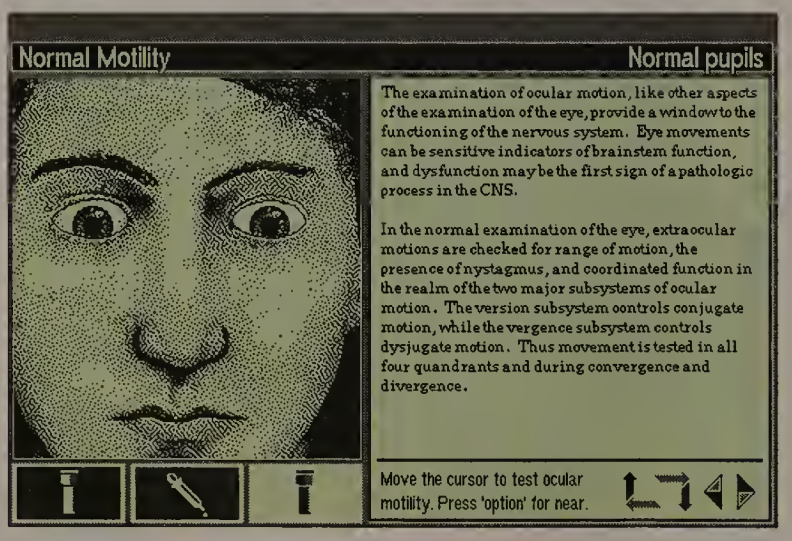
Shown here at the epicenter of the 1989 Loma Prieta, California, earthquake, just west of the summit of Loma Prieta Mountain, intrepid developer Kelly O'Brien does follow-up research for her Earthquake Preparedness Stack.

Stay One Step Ahead

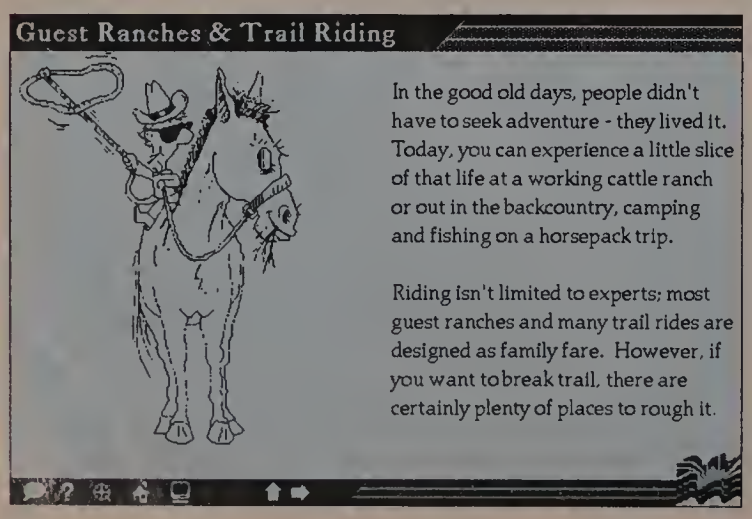
SuperStacks winners know there's more to good interface design than consistent button placement and understandable icons. The winning stacks always stay one step ahead of users, guiding and anticipating user actions.

The Lazy Eye: A Primer of Neuro-ophthalmology, winner for Best Educational Entry, Higher Education, lets medical students perform simulated eye exams on patients by moving the cursor in front of an on-screen patient's eyes and watching the resulting eye movement. (That's exactly what doctors are checking when they wave their fingers in front of your face.) The stack details both normal and abnormal ocular motions and pupillary reflexes in patients with clinically rare, but medically important, conditions. By using the stack, students gain valuable experience for their future practices.

At the bottom of each card in the stack, a control bar offers flashlights for examining the right and left eye, and a dropper for administering drugs (which cause the pupils to dilate or contract). Other buttons jump to drawings illustrating the underlying anatomy of the simulated conditions. As you move the cursor across all buttons, text appears explaining the function and use of each. It's an elegant way to guide the user, and one that makes the stack easy to use (see "The Eyes Have It").



The Eyes Have It The Lazy Eye: A Primer on Neuro-ophthalmology uses HyperCard to simulate the movement of the eyes during an ophthalmological exam. The eyes track the cursor's movements realistically. Turning on the right or left flashlights or administering drugs with the dropper changes the size of the pupils.



Eddie Goes on Vacation Outdoor and Vacation Adventure Guide uses Eddie, a goofy animated character, to lead you through the stack. Note the clear placement of the navigational icons in the lower left-hand corner and the pleasing graphic design of the whole card. As you go to the next card, Eddie takes a dramatic fall off the horse.

The Microsoft Excel Tutorial, winner for Best Training Entry, takes an entirely different approach to user guidance. Created to teach a beginner how to use Microsoft Excel, the stack guides you through a series of three structured lessons. Each lesson begins by defining a concept to be studied, and proceeds with a guided tutorial where you actually create a worksheet, chart, or database by following step-by-step instructions.

As you work, the stack analyzes your actions and provides hints and suggestions when you give incorrect answers, insisting on a sequential solution to the tutorial problems. It really feels as though there's someone helpful at your elbow, gently guiding you through complex concepts and procedures. The stack so skillfully imitates Excel's worksheet format and environment that when you open Excel for the first time, it looks like an old friend.

Looks Count

Just as with books and magazines, the graphic design of hypermedia is a powerful factor in its ability to communicate. The look of a stack or project defines its personality, helps state its purpose, and directs the user to important information.

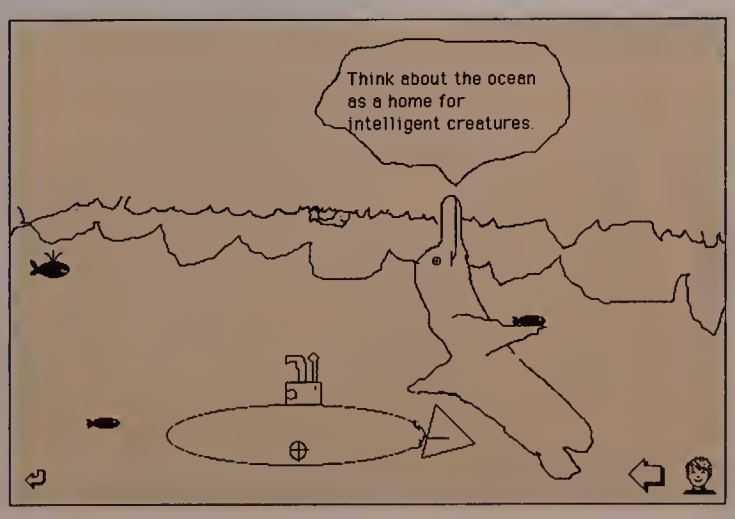
The Mackerel Stack, winner in the Best Interface Design category and of the Leslie Liedtka Memorial Award (for the truly excellent stack that doesn't quite fit in any other subject category), is a playful and wacky combination of promotional information about Mackerel Design's Macintosh work; the biology, history, and enjoyment of the firm's namesake fish; and baseball (don't ask). The stack's striking graphic design captures your interest immediately and keeps your attention all the way through.

The playful content of the stack—there are even six recipes for mackerel you can print out and try—is matched by its unconventional interface, which takes you through all the information in this multidimensional stack (see "What They Do"). Click on the picture of a dog's ears, for instance, and the text message "Macintosh Graphics Systems Consulting" flashes; then the stack jumps to a card explaining how the folks at Mackerel Design have always got their ears perked for interesting new developments in the Mac world. Click on a row of application icons at the left of a screen, and a text field pops up, explaining how the designers use those applications in their work. And the sounds of snare drums, water drops, and digitized voices saying things like "Holy Mackerel!" keep the stack engaging and exciting to explore.

Mix Your Media

Skillfully integrating text, graphics, sound, and animation isn't easy, but the SuperStacks winners know how to do it.

Ludwig van Beethoven Symphony No. 9, winner for Best Commercial Entry, takes media integration the furthest. It combines a CD-audio recording of Beethoven's Ninth Symphony with an informative, interactive HyperCard program that offers insight on the music, the symphony's structure, and Beethoven himself. By offering CD-quality audio recording, expert commentary, and immediate access to any part of the symphony, Symphony No. 9 represents a won-



Song of the Sea More than 100 children contributed to Kids Can Save the Earth. Simple animation and sound provide a cohesive interface that weaves an overall identity around the diverse entries.

The 1990 Winners

Best Commercial Entry
Winner: Ludwig van Beethoven Symphony No. 9; The Voyager Company
Honorable Mention: interFACE; Bright Star Technology
Honorable Mention: TypeChart 1.0b; Octavo Productions

Best Vertical Market Entry
Winner: Display Net; Eric Alderman, The HyperMedia Group, Electronic Catalog Corporation

Best Training Entry
Winner: Microsoft Excel Tutorial 2.2; Curtis Marsden
Honorable Mention: LessonCard; Mel Ristau and Tony Cecala, Visual Interface Architects
Honorable Mention: The Book of MIDI; Steven Rappaport and Opcode Systems

Best Educational Entry, K–12
Winner: Earthquake Preparedness Stack; Kelly O'Brien, Gaja Systems
Honorable Mention: Ballet Tutor; Rosendo Gonzalez and Joyce Wong, Shan-Yee Poon Ballet School
Honorable Mention: Mac Frog 1.0; Bob Doltar

Best Educational Entry, Higher Education
Winner: The Lazy Eye: A Primer of Neuro-ophthalmology; Howard Bregman, M.D., and Phong T. Ly, University of Pennsylvania School of Medicine
Honorable Mention: SuperImage; Joseph Klingler, M.D., Image Analysis Research Center, Medical College of Ohio
Honorable Mention: Bayshore Blast; Paul Baerman, Duke University Press

Best Entry for Under $20 — BMUG
Winner: Kids Can Save the Earth; compiled by Karen Rall and Amanda Goodenough
Honorable Mention: Hyper-Abledata; Gregg Vanderheiden, Trace R&D Center and Newington Children's Hospital

Best Multimedia Entry
Winner: A Simulation of Acute Myocardial Infarction; Lee Andrews, M.D., Joseph Klingler, M.D., Michael Begeman, and Brad Behrendt, Image Analysis Research Center, Medical College of Ohio
Honorable Mention: Women Artists of Color: A Multimedia Research Tool; Dana Bass

(continues)

The 1990 Winners

Honorable Mention: Macroscope; Michael Hamilton, James San Jacinto Mountain Reserve, Regents of the University of California
Honorable Mention: Bird Anatomy II; Patrick Lynch and Noble S. Proctor, Biomedical Communications, Yale School of Medicine

Best Entry by Kids
Winner: El Verbo Simple; Jason Sluzevich
Honorable Mention: HyperMailbox 3.3; E. Kenji Takeuchi
Honorable Mention: The Dancing Mouse and Metromorphosis; Donnie Madsen and Mariner Janes, Wondertree Education Society

Best International Entry
Winner: Outdoor and Vacation Adventure Guide; Lloyd Bernhardt, Motion Works, Vancouver, B.C., Canada
Honorable Mention: Revolución; Hugo Rosatti, Pontifícia Universidad Católica de Chile, Santiago, Chile
Honorable Mention: Terremoto; Ian Bertie, Pontifícia Universidad Católica de Chile, Santiago, Chile

Best Interface Design
Winner: The Mackerel Stack; Gordon Gower, Patrick Rodrigues, and Kevin Steele, Mackerel Design
Winner: Outdoor and Vacation Adventure Guide; Lloyd Bernhardt, Motion Works, Vancouver, B.C., Canada
Honorable Mention: Bird Anatomy II; Patrick Lynch and Noble S. Proctor, Biomedical Communications, Yale School of Medicine

Best Development Tool
Winner: Dialoger Professional 1.5; theResult Software
Honorable Mention: HyperRegister 1.2; George Pytlik
Honorable Mention: Bubble Help for HyperCard; Randal Jones

Leslie Liedtka Memorial Award
Winner: The Mackerel Stack 1.5; Gordon Gower, Patrick Rodrigues, and Kevin Steele, Mackerel Design
Honorable Mention: The Andean World; Charles Brod, Latin American Studies Program, Cornell University
Honorable Mention: Cosmic Osmo; Activision

derful integration of hypermedia and music (see *Reviews, Macworld,* June 1990).

The winner for Best Multimedia Entry, A Simulation of Acute Myocardial Infarction is a SuperCard stack from the Image Analysis Research Center at the Medical College of Ohio. This stack integrates recorded voices with detailed and medically accurate 3-D animations modeled and rendered on computers from Sun Microsystems and Pixar (see "The Heart of the Matter"). Using the stack, medical students can listen to expert medical commentary as they watch animations of cardiological events on the screen.

WALLY MOSS

The Mackerel Stack design team—(clockwise from upper right): Gordon Gower, Patrick Rodrigues, and Kevin Steele—somehow managed to convey their wacky sense of humor in 2-bit black-and-white.

To create Kids Can Save the Earth, winner for the Best Entry for Under $20, Karen Rall and Amanda Goodenough collaborated with more than 100 schoolchildren. The project is a collection of children's essays, poems, artwork, and stacks about eight major problems facing the earth and what can be done to solve those problems. The sounds, animation, and graphics in Kids Can Save the Earth not only surprise the user, but also create continuity between and add personality to the illustrated characters (see "Song of the Sea").

Make the Information Useful

Some SuperStacks entries won because they provide needed information in a creative and useful way. Developed for Electronic Catalog Corporation, Display Net, winner for Best Vertical Market Entry, is a SuperCard electronic catalog for the visual merchandising industry (the people who design store windows and interior displays) that is distributed on CD ROM. Display Net allows you to browse the catalog, select three items at a time for comparison viewing, create an invoice, and place orders automatically through a custom electronic-mail system. The project represents several years' worth of time and effort, and is already in use at several large retail chains including Mervyn's, Lazarus, and Nordstrom who appreciate having all the materials they need in one convenient place.

One particularly vexing problem the developers had to solve was image-

What They Do The striking interface of The Mackerel Stack relies almost exclusively on pictures. If you click on the coffee cup, the stack goes to another card that allows you to see samples of Mackerel Design's illustration work.

color fidelity in the comparison screen, color being an important part of a purchasing decision. To keep colors accurate, the developers first prepared a set of smaller versions of each image using only 80 optimized colors. When you select these items to compare, a series of XCMDs mixes the resulting 240 colors to define the system palette for the set. The three images are then displayed using that system palette, bypassing SuperCard altogether.

JAY ASQUINI

The Medical College of Ohio team scrubbed down and got serious when they created A Simulation of Acute Myocardial Infarction, their multimedia simulation of a heart attack.

Any student of Spanish will appreciate El Verbo Simple, winner of the Best Entry by Kids category. Designed by 16-year-old Jason Sluzevich during his summer vacation, the stack is based around an XCMD that Sluzevich wrote in Think C. The stack conjugates 250 Spanish verbs in 17 tenses and includes the many mystifying and frustrating irregular verb forms. El Verbo Simple has background information and examples for all 17 tenses, so you can read up on that pesky preterite subjunctive. It also lets you search through all the verbs in either English or Spanish, and add your own verbs—the stack conjugates them automatically.

Dialoger Professional 1.5, winner for Best Development Tool, allows scripters to easily add custom dialog boxes to any HyperCard stack, extending HyperCard's functionality while using familiar HyperCard objects (buttons and fields). Dialoger Professional is filled with useful examples, enabling beginners to get started right away; experts, meanwhile, get a head start with the development of custom stacks. It also provides a tutorial and a cross-indexed reference stack for the serious dialog developer.

Secrets Revealed

From places as far away as Santiago, Chile, and from children as young as seven, the 1990 entries were uniformly good, yet incredibly diverse. It is especially exciting that the two categories with the most entries were Best Entry by Kids and Best Educational Entry, K–12. One frustrated judge, knee-deep in entries, said that any of the 1990 entries could have been semifinalists in 1989—and many of them would have been winners.

As SuperStacks repeat winners Lloyd Bernhardt, Amanda Goodenough, Patrick Lynch, and The Voyager Company can attest, practice helps. The continual refinement of interface design, informational organization, graphic design, and media integration makes hypermedia projects better with every iteration.

The 1990 SuperStacks winners represent a cross section of excellence in stack design, and we are proud to present them to you. And this year, many of the winning stacks are available in the Macworld Resource Center area on America Online. Just look for the SuperStacks folder, download the files, and discover their secrets for yourself. M

See *Where to Buy* for contact information.

The Heart of the Matter Imagine being able to fly through the coronary artery. That's exactly what A Simulation of Acute Myocardial Infarction lets you do, thanks to its 3-D animation.

Special Thanks

The 1990 SuperStacks contest couldn't have happened without the discerning opinions of the judges: Mary Bushnell, HyperCard product specialist, Claris Corporation; Eric Carlson, HyperCard engineer, Apple Computer; Steve Costa, founder, BMUG; Doug Doyle, multimedia solutions manager—higher education marketing, Apple Computer; Bob Eddings, HyperCard testing team leader, Apple Computer; Stuart Henningson, strategic marketing manager, Silicon Beach Software; Mike Holm, HyperCard product-line manager, Claris Corporation; Roger Knight, multimedia marketing specialist K–12, Apple Computer; Kevin La Rue, SuperCard product manager, Silicon Beach Software; Linda Neumann, manager of program development, Apple Computer; Robin Shank, HyperCard stack engineer, Apple Computer; and Robertson Reed Smith, HyperCard engineer, Apple Computer.

A special acknowledgment of thanks goes to the following organizations for their support and sponsorship of the 1990 SuperStacks contest: Apple Computer, Claris Corporation, Digidesign, Farallon Computing, Iomega Corporation, National Semiconductor Corporation, Silicon Beach Software, Spinnaker Software, and Storage Dimensions.

GOING THE Ethernet ROUTE

No doubt about it, Ethernet offers Macintosh users a variety of enticing network alternatives. The primary reason so many users are tempted to get onto Ethernet, of course, is speed. Because Ethernet cable can transmit data at faster rates than LocalTalk cable can—10 megabits per second versus 230.4 kilobits per second—using Ethernet instead of LocalTalk to connect an AppleTalk network can mean speed increases of five to six times in network throughput.

If you have two or more separate Mac networks in a building, Ethernet also offers a convenient way to link them. If you create an Ethernet *backbone,* a Mac in one network, or *zone,* can print to a LaserWriter or access a file server in another zone. Finally, Ethernet is an established network standard commonly used by large computers and powerful workstations. Should your Macs suffer from a lack of communication with a Digital Equipment Corporation VAX or a Sun Microsystems UNIX workstation, you can take advantage of Ethernet to bridge that gap.

Luckily, numerous options exist to put the Mac on the Ethernet highway. Add-in boards for the Macintosh SE, SE/30, LC, and II series provide the cable interface necessary to hook up directly to Ethernet. External SCSI devices enable a Mac Plus, Classic, or Portable to access Ethernet directly (see "Ethernet Direct Connect"). And routers—either hardware or software—enable a Mac to access Ethernet via a LocalTalk network rather than through a direct Ethernet connection. Because a router is a shared device, it provides an Ethernet connection to all Macs on the LocalTalk network.

Last year, Macworld Lab reviewed most of the available Ethernet add-in boards and SCSI boxes (see "On the Ethernet Highway," *Macworld,* March 1990). This year, we tested the performance of several LocalTalk-to-Ethernet routers. As we discovered with add-in boards, not all Ethernet routers are created equal.

Planning for Ethernet

Before you make any kind of Ethernet connection, you must first decide what type of Ethernet cable to use. You have three primary choices: thick-wire coaxial, thin-wire coaxial, and unshielded twisted-pair cables.

Unwieldy thick-wire coaxial cable is best reserved for Ethernet backbones. Although a thick-wire coax interface is built into almost all Ethernet hardware devices (boards, SCSI boxes, and routers), connecting to it still requires a separate transceiver and another interface device, called a *tap.*

Thin-wire coaxial cable—currently the most popular way to create an Ethernet network—is much easier to install than thick-wire coax. Thin-wire

RON CHAN

BY DAVE KOSIUR

DAN ESCOBAR

At Lucasfilm's games division, Ethernet routers connect Macs on LocalTalk to PCs and minicomputers on Ethernet.

coax is about the same thickness as television cable. You can connect thin-wire coaxial cable directly to any Ethernet hardware device; the necessary transceiver is built into all such devices.

The newest Ethernet medium is unshielded twisted-pair cable, called UTP or 10BaseT (see "Another Twist to Ethernet"). UTP has proven to be a quick, economical, and more flexible way to connect LocalTalk (PhoneNet-type) networks, and it offers the same capabilities for Ethernet networks. Although not all Mac Ethernet devices offer 10BaseT interfaces, the number that do is increasing rapidly.

Connection Options

Once you've picked the type of Ethernet cable you want to use, you must decide how to attach Macs to the network. Direct Ethernet connections—such as those offered by add-in boards and SCSI devices—are a good idea if you're looking to get the most out of the network's speed. There's now a fierce battle shaping up for a piece of the Ethernet pie, evidenced by dropping costs for such devices. That's one clear reason Ethernet has become a viable alternative to LocalTalk.

Keep in mind, however, that many Macs with a direct connection can't keep up with Ethernet's 10Mbit-per-second speed. Macworld Lab tests of direct-connect devices last year showed that the combination of the SCSI Manager and a hard drive was a considerable bottleneck to Ethernet data transfer. As a result, the real-world performance of add-in boards and external SCSI devices—though two to six times faster than LocalTalk—does not come near Ethernet's maximum transfer rate.

A router, on the other hand, provides a more cost-efficient way to connect a Mac to Ethernet. Although more expensive than a single interface board, a router is shared by all the Macs on a LocalTalk network. As a result, a router lets you hook up a group of Macs for less than it would cost to put a board in, or a SCSI device on, each machine. A router also offers network-management services—zone security and configuration, for example—that add-in boards and SCSI devices can't.

For all routers, LocalTalk is the limiting factor in performance; some traffic must either enter or leave the router at LocalTalk speeds. That's a far cry from being directly on Ethernet. Thus, a router is most appropriate when you have a group of Macs that don't need constant access to Ethernet. For example, users may need the Ethernet connection only to send an occasional piece of

ANOTHER TWIST TO ETHERNET

Since the Institute of Electrical and Electronics Engineers certified unshielded twisted-pair (UTP) cable as an official Ethernet medium last October, Mac users have been hit with a flood of 10BaseT Ethernet interfaces. Why all the fuss? Because UTP provides a way to install Ethernet networks using one of the least expensive and most common types of wiring—telephone wiring—without compromising network performance.

If you're planning to use UTP to connect an Ethernet network, keep in mind that its setup differs from that of a PhoneNet network, which also employs unshielded twisted-pair cable. (For more information on using UTP in PhoneNet networks, see "Networking for the Novice," *Macworld,* December 1990.)

- Unlike PhoneNet-type networks, which need only one pair of twisted-pair cable, a UTP Ethernet network requires two pairs of wire for each connection. One pair is used for transmitting data, the other for receiving data.
- Ethernet networks using UTP must be *active star* networks. In other words, they require an active hub, or concentrator, to connect each *branch* of the network. This differs from PhoneNet, which does permit creation of *passive star* networks without a hub. These hubs perform the same signal-amplification duties for Ethernet that Farallon's StarController or Nuvotech's TurboStar performs for PhoneNet-type networks.
- Only one node can be attached to each branch of a UTP Ethernet network. You cannot daisy-chain several nodes on a branch as you can with PhoneNet-type networks.
- Each node on a UTP Ethernet network must be no more than 100 meters from the central hub. This may not be a problem for you: AT&T reports that 95 percent of all phone connections have a telephone within 100 meters of a wiring closet. If wire quality is poor, the nodes must be closer to the hub. Before setting up a UTP Ethernet network, you should check not only the lengths of each network branch but also wire quality.

ROUTERS COMPARED

Router	Company	Price	Maximum Number of Ports (LocalTalk/Ethernet)	Centralized Configuration	Diagnostics, Statistics	Automatic Restart	Security Zone/Password	Phase Support 1/2/Mixed	Other Protocols Supported	Remote Access
AppleTalk Internet Router 1.0	Apple Computer	$399	2/6	○	●	●	○/●	●/●/●	none	○
ComTalk 2.0	APT Communications	$3250+	6/1	●	●	●	●/●	●/●/●	TCP/IP	●
E-Server/LAN [1]	Solana Electronics	$2795	2/1	●	○	●	○/○	●/●/●	none	○
EtherGate 3.15	Shiva Corporation	$2399	2/1	●	●	●	●/○	●/●/○	TCP/IP	●
EtherRoute 1.5.4	Compatible Systems	$1495	2/1	●	●	●	●/●	●/●/●	TCP/IP	○
FastPath 4 8.0.1	Shiva Corporation	$2795	1/1	●	●	●	●/○	●/●/●	TCP/IP, DECnet	○
GatorBox 1.6	Cayman Systems	$2795	1/1	●	●	●	●/○	●/●/●	TCP/IP	○
MacGateWay AT 2.0	Wollongong Group	$2295	2/1	○	○	○	○/○	●/○/○	TCP/IP	○
MaxWay 500 2.05	Tri-Data Systems	$5495+	4/2	●	○	●	○/○	●/●/●	TCP/IP, IPX, SNA	○
MultiPort Gateway 1.24	Webster Computer	$4995	4/1	●	●	●	○/○	●/○/○	TCP/IP	○
MultiGate 2000	Network Resources Corporation	$1995	2/1	●	○	●	○/○	●/●/●	TCP/IP	○
MultiGate Mac 1.0	Network Resources Corporation	$795	2/4	○	●	●	●/●	●/●/●	TCP/IP	○
Net One MaxTalk 16.3	Ungermann-Bass	$4695	16/1	●	●	●	○/●	●/○/○ [2]	TCP/IP	○
PhoneNet Liaison 3.00	Farallon Computing	$395	2/5 [3]	○	●	●	●/●	●/●/●	none	●

● = yes; ○ = no [1] Not tested. [2] Phase 2 support planned for first quarter 1991 release. [3] Liaison supports a maximum of 5 network interfaces at one time.

electronic mail to a VAX, to download a file from another zone's file server, or to access a shared database file elsewhere on the network.

Comparing Routers

A router's primary job is passing network data, or *packets,* between LocalTalk and Ethernet networks. However, the formats of LocalTalk and Ethernet network packets differ, particularly in the way they specify destination. The router, then, must ensure that LocalTalk packets are provided with the correct destination address for Ethernet nodes, and that Ethernet packets are correctly formatted for LocalTalk destinations.

There are two types of routers: hardware routers and software routers. Hardware routers range from simple devices that handle one or two LocalTalk networks and one Ethernet network to high-end devices that support from 4 to 16 separate LocalTalk networks and 2 Ethernet networks. *Multiport routers,* those with more than one LocalTalk port, can be a distinct advantage if you need to connect multiple LocalTalk networks to an Ethernet network.

Low-end hardware routers typically employ a 68000 microprocessor to process all the network traffic that passes between the LocalTalk network and the Ethernet network. But to handle the greater number of attached networks, high-end hardware routers must have more processing horsepower—the primary reason for their higher cost. For example, Tri-Data's MaxWay 500 uses a Scalable Processor Architecture (SPARC) chip from Sun Microsystems. Ungermann-Bass's Net One MaxTalk takes a different tack: instead of using one more-powerful processor to control all the network ports, it uses multiple processors to handle network ports.

Software routers are programs that enable you to turn any Mac—including an AppleShare file server or electronic-mail server—into a router. As a result, software routers are especially appealing to a network manager who either has a spare Mac to devote to routing tasks or wishes to install the router software on a server. Keep in mind, however, that although software routers can be cost-effective alternatives to hardware devices, the performance of both the router and the server can degrade considerably if traffic on the network is heavy.

Speed Tests

Even though some network traffic must travel at LocalTalk rates, any router that connects a LocalTalk user to Ethernet at a speed significantly slower than that of LocalTalk isn't of much use. In fact, the router itself becomes a network bottleneck if it can't forward packets fast enough. Macworld Lab tested 13 routers to see how quickly they transfer data between LocalTalk and Ethernet (see "Router Speed Tests").

In the first set of tests, a single router linked a single LocalTalk network and a single EtherTalk (AppleTalk protocols on Ethernet cable) network. The results have some interesting implications for users on traffic-heavy networks. When only one user transfers a file through the router, every router performs at about the same pace. But as traffic through the router increases—as more users access the router simultaneously—some routers suffer performance lapses. Shiva's EtherGate fared the worst by far; it took almost six times longer to transfer a file with four users than with one user. (Shiva says a new version of EtherGate software, currently under development, will improve the EtherGate's routing speed.)

The second set of tests used two identical routers to connect two LocalTalk networks to an Ethernet backbone. Compared to the results of

Router Speed Tests

All times in seconds

Single-Router Test

** Tested only with Phase 1.*

Macworld Lab tested 13 routers in two different network configurations. The first setup employed one router to connect a LocalTalk network and an EtherTalk network (AppleTalk protocols running on Ethernet cable). In the second configuration, two identical routers provided two LocalTalk networks access to an Ethernet backbone.

On the LocalTalk network were four 8MB Mac IIcx computers set up as AppleShare servers; four other 8MB Mac IIcx's, configured as AppleShare clients, resided either on the EtherTalk network (the first configuration), or on another LocalTalk network (the second configuration). Each server was paired with one client to ensure that any measured bottlenecks were the result of the single-router tests, every router's performance was slower, usually by 10 to 20 percent. The decline in speed most likely occurs for two reasons. First, two protocol translations, not one, are necessary in a backbone configuration. One router must format a LocalTalk packet so it can be sent over Ethernet; the other router must strip the Ethernet address from the packet to send the packet to its final LocalTalk destination. Second, each router must periodically provide the other router with information about the networks it services. As a result, there's additional traffic on the network.

For pure speed, high-end multiport routers can't be beat. The MaxWay 500 and APT Communications' ComTalk routers consistently shared the honors for fastest router. All the software routers functioned well—in some cases, outperforming some hardware routers. To achieve maximum performance, however, a software router must run on a dedicated Mac. When we configured Farallon's PhoneNet Liaison to run in the background with a lower priority, Liaison's routing performance slowed by 34 percent. Neither Apple's AppleTalk Internet Router nor Network Resources Corporation's (NRC) MultiGate Mac allows you to prioritize routing when run on a nondedicated Macintosh.

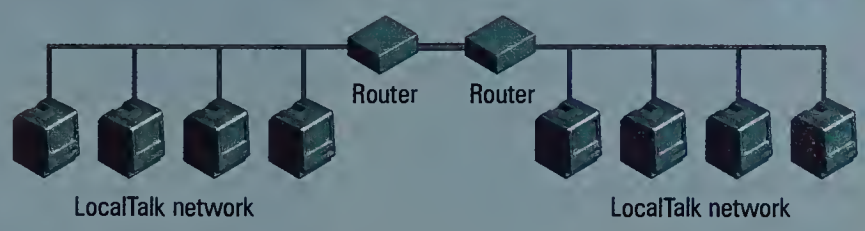
Macworld Lab also performed a separate set of tests on multiport routers. Judging by our results, each LocalTalk port really does behave as a separate router. At the same time, each port still quickly routes traffic to Ethernet. For example, four 1MB file transfers performed simultaneously through four separate ports took only 50 seconds each to complete. That compares favorably to the time it took to transfer a single file over one port, as well as to the time it took to transfer four files over one port.

More Than Speed

When choosing a router, however, you should also consider factors other than speed. Almost all of the 13 routers tested have some options—ranging from foreign protocol (non-AppleTalk) support to additional hardware features—that make them unique (see "Routers Compared").

Configuration and Management It probably comes as no surprise that

Backbone Test



** Tested only with Phase 1.*

network and router performance, not server performance. Software routers used a dedicated Mac SE/30 with 8MB of RAM. To see how each router handled increasing amounts of traffic, we transferred a 1MB file from a server to its client ten times. The file transfers were then performed with two client-server pairs, then three, and finally four.

Except where noted, all routers used AppleTalk Phase 2 protocols, not AppleTalk Phase 1. Performance of routers using Phase 1 protocols was less than 4 percent slower than performance of routers using Phase 2 protocols. Routers are ranked from top to bottom, in each of the two tests, based on their overall performance.

different routers have different configuration and management schemes. With two exceptions—the Wollongong Group's MacGateWay AT and Ungermann-Bass's Net One MaxTalk—you can configure and manage all hardware routers from a central Macintosh on the network. Because of the fact that the MacGateWay AT can be configured only with a Macintosh attached to its LocalTalk port, managing more than one MacGateWay AT on a network is quite difficult. The Net One MaxTalk, meanwhile, requires an IBM PC for configuration management.

As for software routers, they can be configured only at the Macintosh they are installed on, making central management of multiple software routers impossible. Apple's AppleTalk Internet Router's configuration is handled via a desk accessory; Farallon's Liaison uses the Chooser, while NRC's MultiGate Mac employs a HyperCard stack.

If you have multiple routers on a network, configuring and managing them is easier if they all support *seeding*. Seeding allows one router, which is called the seed router, to store all the appropriate network numbers and zone information for other routers on the network. When you attach other routers to the network, they acquire network configuration information from the seed router. Not all routers can act as seed routers, nor do all routers accept data from seed routers.

Automatic Restarts Another router capability that should be near and dear to managers' hearts is automatic restarting. Not all routers can remember their configuration upon restarting after a power loss. Shiva's FastPath 4 and EtherGate and Compatible Systems' EtherRoute store their configuration information either in battery-backed-up memory or nonvolatile programmable read-only memory (PROM).

On the other hand, the Cayman Systems GatorBox remembers only basic routing information after a power outage occurs. The GatorBox can be instructed, however, to automatically download more detailed information from either a Macintosh on LocalTalk—which I consider to be a definite disadvantage—or a UNIX computer on the network. Similarly, the NRC MultiGate 2000 can be set

to download more detailed information from a Macintosh running the MultiGate Manager software.

AppleTalk Phase Support Not all routers provide support for AppleTalk Phase 1 and AppleTalk Phase 2 protocols. At testing time, three routers—the Net One MaxTalk, Webster's MultiPort Gateway, and the MacGateWay AT—supported only Phase 1 protocols.

Although Phase 1 protocols can suffice for smaller networks, Phase 2 protocols improve the behavior of routers on large networks. In addition, Phase 2 permits up to 16 million AppleTalk nodes on Ethernet, while Phase 1 restricts the number of AppleTalk nodes to 254. Finally, keep in mind that some products—such as Farallon Computing's PhoneNet Talk—require Phase 2 protocols when running on Ethernet.

Routers that do support both Phase 1 and Phase 2 protocols can often be used as transitional routers. With them, you can upgrade a network to Phase 2 protocols gradually, rather than all at once.

TCP/IP Support LocalTalk-Ethernet routers are often used as Transmission Control Protocol/Internet Protocol (TCP/IP) *gateways,* linking an AppleTalk network of Macs to an existing IP network. With a router that supports TCP/IP protocols, Macs can exchange information with other computers such as IBM mainframes, DEC VAXs, Cray supercomputers, and Sun workstations. In addition, an IP Ethernet backbone can connect geographically separated AppleTalk networks.

The FastPath and the GatorBox offer perhaps the most extensive range of TCP/IP services. (The FastPath also supports DECnet protocols.) Additional software from Cayman allows Macintosh users to access files on Network File System (NFS) file servers or UNIX users to print to LaserWriters.

Serial Support Another router feature that may appeal to users is dial-in support. Some routers, such as Liaison, do permit remote access. A user can then call the router via a modem to use network resources such as file servers, E-mail, and printers. The EtherGate provides an interesting twist

ETHERNET DIRECT CONNECT

Product	Vendor	Price	Mac	Transceivers [1] Thick	Thin	UTP
Asante EN/SC [2]	Asante Technologies	$595	all	●	●	●
DaynaPort E/30	Dayna Communications	$399	SE/30, IIsi [3]	●	●	○
DaynaPort E/30-T	Dayna Communications	$399	SE/30, IIsi	○	○	●
DaynaPort E/II	Dayna Communications	$399	IIsi, II, and up [4]	●	●	○
DaynaPort E/II-T	Dayna Communications	$399	IIsi, II, and up	○	○	●
DaynaPort E/LC [5]	Dayna Communications	$399	LC	●	●	○
DaynaPort E/LC-T [5]	Dayna Communications	$399	LC	○	○	●
DaynaPort E/SE	Dayna Communications	$399	SE	●	●	○
DaynaPort E/SE-T	Dayna Communications	$399	SE	○	○	●
DaynaPort E/si	Dayna Communications	$399	IIsi	●	●	○
DaynaPort E/si-T	Dayna Communications	$399	IIsi	○	○	●
E4010	Cabletron Systems	$699	SE	○	○	●
E4020	Cabletron Systems	$599	SE	●	●	○
E5010	Cabletron Systems	$699	SE/30, IIsi	○	○	●
E5020	Cabletron Systems	$649	SE/30, IIsi	●	●	○
E6010	Cabletron Systems	$699	IIsi, II, and up	○	○	●
E6020	Cabletron Systems	$699	IIsi, II, and up	●	●	○
Ether TnT II	Generation Systems	$395	IIsi, II, and up	○	●	○
Ether TnT IIsi	Generation Systems	$395	IIsi	○	●	○
Ether TnT LC	Generation Systems	$395	LC	○	●	○
Ether TnT SE	Generation Systems	$395	SE	○	●	○
Ether TnT SE/30	Generation Systems	$395	SE/30, IIsi	○	●	○
Ether TwP II	Generation Systems	$395	IIsi, II, and up	○	○	●
Ether TwP IIsi	Generation Systems	$395	IIsi	○	○	●
Ether TwP LC	Generation Systems	$395	LC	○	○	●
Ether TwP SE	Generation Systems	$395	SE	○	○	●
Ether TwP SE/30	Generation Systems	$395	SE/30, IIsi	○	○	●
Ether+	Compatible Systems Corporation	$495	all	●	●	○
Ether2	Compatible Systems Corporation	$395	IIsi, II, and up	●	●	○
EtherDS	Compatible Systems Corporation	$395	IIsi	●	●	●
EtherLink/NB	3Com Corporation	$595	IIsi, II, and up	●	●	○
EtherLink/SE	3Com Corporation	$495	SE	●	●	○
Ethernet LC Card [6]	Apple Computer	$375	LC	○	●	●
Ethernet NB Card [6]	Apple Computer	$599	IIsi, II, and up	○	●	●
EtherNode 16 NB	National Semiconductor Corporation	$495	IIsi, II, and up	●	●	○
EtherNode 16 NB-T	National Semiconductor Corporation	$495	IIsi, II, and up	●	○	●
EtherNode 16 SE	National Semiconductor Corporation	$449	SE	●	●	○
EtherNode 16 SE-T	National Semiconductor Corporation	$449	SE	●	○	●
EtherNode 32 SE/30	National Semiconductor Corporation	$595	SE/30, IIsi	●	●	○
EtherNode 32 SE/30-T	National Semiconductor Corporation	$595	SE/30, IIsi	●	○	●
EtherPort II	Shiva Corporation	$499	IIsi, II, and up	●	●	○
EtherPort IIT	Shiva Corporation	$499	IIsi, II, and up	●	○	●
EtherPort SE	Shiva Corporation	$499	SE	●	●	○

● = *yes;* ○ = *no*

[1] *Some boards or devices may not support all available transceivers simultaneously.*

[2] *Has 2 SCSI ports.*

[3] *IIsi requires Macintosh IIsi 030 Direct Slot Adapter Card.*

Product	Vendor	Price	Mac	Transceivers [1] Thick	Thin	UTP
EtherPort SE/30	Shiva Corporation	$499	SE/30, IIsi	●	●	○
EtherPort SE/30T	Shiva Corporation	$499	SE/30, IIsi	●	○	●
EtherPort SET	Shiva Corporation	$499	SE	●	○	●
EtherVHP	Compatible Systems Corporation	$595	IIsi	●	●	●
FastNet III	Dove Computer Corporation	$499	IIsi, II, and up	●	●	●
FastNet LAN 020 [7]	Dove Computer Corporation	$1849	SE	●	●	○
FastNet SE	Dove Computer Corporation	$499	SE	●	●	●
FastNet SE/30	Dove Computer Corporation	$499	SE/30, IIsi	●	●	●
FastNetSCSI	Dove Computer Corporation	$1249	all	●	●	○
FriendlyNet LC Card [5, 6]	Asante Technologies	$349+	LC	●	●	●
GatorCard E/II	Cayman Systems	$595	IIsi, II, and up	●	●	○
LanWay E-10T	Tri-Data Systems	$425	IIsi, II, and up	●	○	●
LanWay E-10T	Tri-Data Systems	$425	SE/30, IIsi	●	○	●
LanWay E-10T LC [6]	Tri-Data Systems	$345	LC	●	●	●
LanWay E-10T LC-10Base-T	Tri-Data Systems	$425	LC	○	○	●
Mac1000	Network Resources Corporation	$345	IIsi, II, and up	●	●	●
Mac1000	Network Resources Corporation	$345	SE	●	●	●
Mac2000	Network Resources Corporation	$999	IIsi, II, and up	●	●	●
MacConnect SE	Racal-InterLan	$495	SE	●	●	○
MacConnect SE/30	Racal-InterLan	$550	SE/30, IIsi	●	●	○
MacCon+30i	Asante Technologies	$495	IIsi, SE/30	●	●	○
MacCon+30iT	Asante Technologies	$495	IIsi, SE/30	●	○	●
MacCon+IIE	Asante Technologies	$495	IIsi, II, and up	●	●	○
MacCon+IIET	Asante Technologies	$495	IIsi, II, and up	●	○	●
MacCon+SEE	Asante Technologies	$395	SE	●	●	○
MacCon+SEET	Asante Technologies	$395	SE	●	○	●
Magic EtherNet II	MacProducts USA	$249	IIsi, II, and up	●	●	○
Magic EtherNet II/10T	MacProducts USA	$249	IIsi, II, and up	●	○	●
NIA310 MacConnect	Racal-InterLan	$495	IIsi, II, and up	●	●	○
NIA310 MacConnect-10BT	Racal-InterLan	$550	IIsi, II, and up	●	○	●
NuvoLink II	NuvoTech	$395	IIsi, II, and up	●	●	○
NuvoLink II-T	NuvoTech	$395	IIsi, II, and up	○	○	●
NuvoLink SC	NuvoTech	$549	all	●	●	○
NuvoLink SC-T	NuvoTech	$549	all	○	○	●
PhoneNet Card for Ethernet [8]	Farallon Computing	$595	SE/30, IIsi	●	●	●
PhoneNet Card for Ethernet [8]	Farallon Computing	$595	IIsi, II, and up	●	●	●
SpeedLink II	Everex Systems	$449	IIsi, II, and up	●	●	○
SpeedLink SE	Everex Systems	$449	SE	●	●	○
SpeedLink SE/30	Everex Systems	$449	SE/30, IIsi	●	●	○
SpeedLink/II TP	Everex Systems	$449	IIsi, II, and up	●	○	●
SpeedLink/SE TP	Everex Systems	$449	SE	●	○	●
SpeedLink/SE30 TP	Everex Systems	$449	SE/30, IIsi	●	○	●
Technology Works Mac II Ethernet Kit	Technology Works	$299	IIsi, II, and up	●	●	○
Technology Works Mac II/10T Ethernet Kit	Technology Works	$299	IIsi, II, and up	●	○	●
UTPMac	NetWorth	$499	Mac IIsi, II, and up	●	○	●

[4] Indicates Mac II, IIx, IIcx, IIci, and IIfx; IIsi requires Macintosh IIsi NuBus Adapter Card.

[5] Floating-point unit option available.

[6] Supports Apple Ethernet Cabling System.

[7] Includes 68020 accelerator.

[8] Includes Timbuktu.

to this scheme. Not only can it act as a router, but it also has a serial port that allows Ethernet and LocalTalk users to share a modem or printer.

The Final Word

Because of their LocalTalk connections, routers do not provide the performance that Ethernet add-in boards or SCSI devices do. However, Ethernet-to-LocalTalk routers offer advantages that those direct-connect methods don't.

First, a router can be shared by an existing LocalTalk network. If you have a number of occasional users of Ethernet-based services, a router is definitely a reasonable alternative to buying an Ethernet board for each user, even in spite of the fact that prices are dropping for add-in boards. Second, a router provides more services to LocalTalk users. For example, by using a TCP/IP gateway, you can access UNIX (or other) computers. Third, routers can be used to help control traffic on Ethernet networks. Just as LocalTalk-only routers keep traffic from affecting all users on a network, LocalTalk-to-Ethernet routers restrict traffic to the networks on which the source and destination computers sit.

If you're starting from scratch, I recommend the EtherRoute as a single-port router. At $1495, it's a bargain, and for $400 more, EtherRoute includes TCP/IP services. The single-port version of APT Communications' ComTalk is my second choice: it performs better than the EtherRoute, but also costs more at $3250.

For those situations where you can tie four LocalTalk networks into one location, the MaxWay 500 is a definite price-performance winner. Four EtherRoutes would cost $5980, while the MaxWay 500 is $5495. That's only a small price savings, but the MaxWay 500 is faster. Ⓜ

See *Where to Buy* under Ethernet Products for contact information.

Dave Kosiur, *a* Macworld *contributing editor, is the editor and publisher of* Connections, *a newsletter concerned with networking.*

by David Pogue

THE DESK POTATO'S GUIDE TO *Macros*

SIT DOWN AND GET LAZY. HERE'S MACWORLD'S GUIDE TO SOFTWARE SERVANTS.

ask the maker of a macro program, "What's so great about macros?" The response will surely include the mandatory phrases "automate your Mac," "enhance productivity," and "increase efficiency."

But want to know the real reason macros are great? Because they let you be lazy. By performing tedious, repetitive, boring tasks you usually have to do yourself, a macro program lets you kick back and relax while it types the date, sorts a database, or backs up that hard drive. This puts some of the work load back where it belongs: on the sturdy shoulders of an expensive computer. All you have to do is tell it, with a keystroke, which tedious task to begin—and get used to the privileges of desk potatoism.

And goodness, no—there's absolutely nothing wrong with being a desk potato. Indeed, it's something to be proud of! Desk potatoes represent people over machines, brains over brawn; desk potatoes live to max their Macs while expending as little energy as possible themselves. They thrill to programs like Nisus, MicroPhone, and Excel, which have built-in macro capabilities; and they absolutely slaver at the prospect of general-purpose macro programs, which let them reduce their net muscular activity in any application.

If you're not already using macros, you'll be amazed at how much effort they can save. And if you're considering getting into them, there are a few options: there's Tempo II Plus, QuicKeys[2], Apple's MacroMaker (free with System 6.05 or later), AutoMac III (free with Microsoft Word), and MasterStrokes (free with Datadesk 101 keyboards). In any case, let your fingers do the walking through this guide to the software servants.

JANICE RUBIN

Macros in Space Dr. Kritina Holden, Human Factors Engineer for Lockheed Engineering and Sciences Company at the NASA Johnson Space Center, used AutoMac III and QuicKeys² aboard the space shuttle to do the data collection in a series of experiments designed to evaluate cursor control devices for use in zero gravity.

The Tasks

A macro program lives in the System Folder (they're INITs or cdevs—programs that run automatically at startup). To signal a macro program that you want to teach it something new, choose Start Recording from a menu (or press a keyboard equivalent). Then, at whatever lazy pace you want, you go through one fragment of your daily routine: choose Set Startup; open your address-book DA; type your return address—whatever. The macro program watches, lurking, learning, until you finish. It pops a dialog box up on the screen, asking what trigger key you want to teach it.

This, of course, is precisely why you've got all those weird-looking keys on your extended keyboard: Home, PgUp, F1, F2, Control, and so on. Teach the Home and End keys to go to the beginning or end of a file. Use F1 to type your modem-service password. Assign Control-C to open the Calculator. The sky's the limit.

The only hitch: teaching a job to a macro is similar to teaching it to someone new at the office. Like sorcerer's apprentices, they have the potential to wreak minor havoc if you're not careful and explicit when explaining the task. And sometimes they're too dumb to get the concept even when you're the quintessence of clarity. So let's throw some typical tasks at each of the five programs in the Mac macro macrocosm. Let's find out not only how well they perform, but also how well they learn. For each challenge, you'll rate each program according to the International Committee on Personal Inertia's laziness scale, the *Système des Points d'Utilisation Diminuation* (otherwise known as SPUD points). The higher the SPUD point rating, the better a macro program's capacity for decreasing your grunt-work quotient.

Menu Manipulation: Taking Out the Trash

In the Finder, you can press ⌘-N to create a new folder, ⌘-O to open something, and so on. But to empty the Trash, you have to grab the mouse, roll up to the Special menu, and choose Empty Trash—by the desk potato's standards, an unforgivable expenditure of calories. With a good macro program, you can empty the Trash (or select any other menu command) without taking your hands off the keyboard.

All five programs pass this test with flying colors. You start recording, choose Empty Trash, stop recording, and give the new macro a keystroke (⌘-T has a nice ring). Immediately afterward—and forevermore—you can empty the Trash by pressing ⌘-T. All but Tempo II Plus empty the Trash so fast it's unbelievable. (Tempo II Plus, whose macros are stored on disk instead of in memory, waits about one second before performing its feat.) At first, you may feel a little out of control. But once you realize that your software slave is only doing what you've asked, you'll start to feel the desk potato's warm glow of lethargy.

QuicKeys² and Tempo II Plus even offer an important additional menu feature: the ability to select a menu command either by its position on the menu (as the other three programs do) or by its name. You might want a by-name menu macro for Word's Italic command, for example, because its position in the menu changes depending on whether Full Menus or Short Menus is in effect.

Mouse Maneuvers: Dragging Disks

Choosing a menu command is one thing; what about something that requires a little more brains, like dragging a floppy-disk icon to the Trash? Four out of the five macro programs perfectly record and play back this one-drag macro (MasterStrokes can't drag). But suppose you're creating a presentation for the Idaho Tuber Growers Association, and want a macro to magically draw a many-eyed potato logo before the assembled throngs? You need a macro to move the mouse in more complex ways than just straight lines.

With MasterStrokes or MacroMaker, you're out of luck. They define mouse movements solely by the starting and ending points. AutoMac III, QuicKeys², and Tempo II Plus offer a Real Time playback mode, where mouse movements are replayed precisely as they were recorded—zigs, zags, hesitations, and all. Using a real-time macro, you can create anything from an animated Mac training "video" to a complete MacPaint cartoon . . . with one keystroke.

Window- and Box-Brains: Doing Windows

In the desk potato's never-ending quest to minimize mouse activity, cutting down window-clicking and dialog box–clicking is high on the list. Wouldn't it be simpler to press Control-C to close, Control-B for Best Quality, and so on?

QuicKeys² has an awesome advantage in the window-handling event, because it has a number of predefined window macros: Close Window, Select Rear Window, and so on. They work regardless of the window's position: the Close Window macro closes the front window even if its close box is offscreen. Thus QuicKeys²'s Zoom Window macro is especially useful when a window is completely off the screen (because it was saved on a bigger monitor); QuicKeys² neatly centers and resizes the window.

While there are no canned window macros for Tempo II Plus and MacroMaker, those programs also have the brains to apply macros to the active window, even offscreen. AutoMac III, though, only does windows if their close or zoom boxes are onscreen. And if the window has moved since you recorded the macro, your MasterStrokes window-zoom macro just clicks futilely on the desktop.

Having a Dialog

Another task the effort-conserver often delegates to a macro is selecting

items in dialog boxes. Suppose, for instance, that you want your subhead macro, Control-S, to select Bold and Small Caps in Word's Character dialog box. Any macro program could learn to click on check boxes. Trouble is, if you apply the same macro to a passage that's already bold, it clicks the Bold check box a second time, turning Bold off. That's why QuicKeys² and Tempo II Plus have a click-only-if-button-is-off option, so they click only if the check boxes aren't already checked.

You might think Control would be the perfect macro key, since it's almost never used in applications. Yet AutoMac and MasterStrokes don't recognize the Control key. And while we're at it: a macro program should let you create unmodified letter-key macros, too, so that pressing the P key in MacPaint selects the Pencil tool, for example. But Tempo II Plus and MasterStrokes require at least one modifier key (except for F-keys). AutoMac doesn't even let you use the function keys.

Keyboard Skills: Taking a Letter

All right. You've reduced your mouse usage to the absolute minimum. The desk potato's next priority is to cut down on that other major energy-waster: typing. Why on earth should you consult your calendar and type the date at the top of every letter? You've got a computer, for goodness' sake!

QuicKeys² and Tempo II Plus are ready and waiting; each has an assortment of ready-made date-stamping macros in all different formats. Slap that macro onto the F5 key and forget about looking up the date. The other programs have no such built-in features. The best you can hope to create is a macro that opens the Alarm Clock desk accessory, copies the date, and pastes it. Even that method's not ideal, unless you want "5:17:52 PM 3/9/91" at the top of your letter.

Boiling Over

Of course, a macro can learn to type more than just the date. Your return address is a typical candidate. So are frequently used lengthy or hard-to-type phrases (the MacroMaker manual gives Zbigniew Brzezinski as an example). Lawyers and others who draw up contracts have plenty of standard paragraphs; they're called *boilerplate* text, and they're a cinch with macro programs.

MacroMaker and AutoMac III have basic boilerplate skills: start recording, then type the passage. QuicKeys² is slightly better at boilerplate text, because it lets you copy the text from an existing document (instead of typing it again for the macro's benefit).

Tempo II Plus takes boilerplate text so seriously that it has a special feature called Autopaste. You don't even have to copy the text into Tempo II Plus—just select text in a word processor and choose Autopaste from the Tempo menu. This even works with graphics like your signature. When the time comes to sign your letter, hit Control-S (or whatever's been assigned); after Tempo II Plus's characteristic one-second hesitation, your signature pops into your letter.

If there's an approach that's better yet, it's MasterStrokes'. You trigger the automatic typing not with a ⌘- or function-key combination, but with an abbreviation. That is, type normally; when it's time to insert the vegetable du jour, just type **FRIES** (with a space on each side); MasterStrokes instantly backspaces over the word and types "A tenderly fragrant serving of fresh potato product, lovingly fried in Kansas beef fat, and served with a tasty dash of granulated sodium chloride."

Multistep Macros and Looping: Work Processing

No desk potato would stop at macros that only relieve them of a keystroke or two. Power macro users learn to create multistep macros, or sequences, that perform a whole series of actions in a row.

Suppose you've completed a 70-page paper on warships—so much sheer labor it'd turn the average desk potato's hair white. Imagine your horror when you discover that ships' names should be italicized. Using Word's Find command, you could create a macro that searches for the ship prefix (USS), highlights the following word (such as *Constitution*), and chooses Italic. But there are 250 ship references in the paper. You need

THIRTY GREAT JOBS FOR MACROS

Get your hands off that mouse! Here are 30 great uses for macro programs that are already saving people thousands of cumulative hours. And think: each merely requires one keystroke.

Most of these macros have already been made up for you. They're available at no charge from America Online, in the Macworld Resource Center (keyword: Macworld), in MacroMaker, Tempo II, and QuicKeys² formats. Start downloading and get lazy.

Task	Macro Program
Back up hard drive (today's work)	A, Q, T
Change printers via Chooser	A, MM, MS, Q, T
Change tools (PageMaker, MacPaint, Canvas, and so on)	A, MM, MS, Q, T
Check InBox for new mail; save it	T
Choose common font/size combination	A, MM, MS, Q, T
Convert all straight quotes to curly quotes (existing file)	T
Convert all straight quotes to curly quotes (while typing)	Q
Drag top MultiFinder window to bottom of screen	A, MM, MS, Q, T
Eliminate extra spaces between sentences	A, MM, MS, Q, T
Fetch logo from Scrapbook and paste it	A, MM, MS, Q, T
Find/delete Word Temp files (using DiskTop)	Q, T
Initialize blank floppy disk	A, MM, Q, T
Jump to a specified folder when you Open or Save	T, Q
Launch Excel (or any program)	Q, T
Log on to online service (America Online, CompuServe, Delphi...)	A, Q, T
Mount AppleShare volume	Q
Open address-book desk accessory	A, MM, MS, Q, T
Print only page 1	A, MM, MS, Q, T
Reconfigure numeric keypad (put 1, 2, 3 on top row)	Q, MM
Replay all steps up to a crash (while programming)	T
Restart or shut down the Mac (within any program)	Q
Save your work every ten minutes	A, Q, T
Select next window	Q, T
Select Text Offset for a graphic (PageMaker)	A, MM, MS, Q, T
Set clock to Daylight Savings Time	A, MM, MS, Q, T
Strip linefeeds from telecom text	T
Switch color monitor to B&W (or back)	A, MM, MS, Q, T
Type "SUM()" in Excel, put cursor between ()'s	A, MM, MS, Q, T
Unstuff a StuffIt Deluxe archive	Q
Zoom all PageMaker pages to same % view	T

A=AutoMac III, MM=MacroMaker, MS=MasterStrokes, Q=QuicKeys², T=Tempo II Plus.

SPUD POINTS

Menu Manipulation

All of the programs are superb for choosing menu items, but Tempo and QuicKeys² get an extra SPUD point apiece for their intelligence in choosing commands by name.

AutoMac III	4
MacroMaker	4
MasterStrokes	5
QuicKeys²	5
Tempo II	5

Mouse Maneuvers

Tempo and AutoMac get extra SPUD points because they're the best at mouse maneuvering, and they let you incorporate real-time segments into regular (step-time) macros; a QuicKeys² macro must be recorded in either all real-time or all step-time. MacroMaker drags the mouse only in a straight line; MasterStrokes can't even do that properly.

AutoMac III	5
MacroMaker	2
MasterStrokes	
QuicKeys²	4
Tempo II	5

Window- and Box-Brains

QuicKeys² excels at doing windows, with its pre-made, surefire, and trustworthy window macros. Tempo and MacroMaker do equally well, although their window macros aren't canned. AutoMac works only if the window is fully on screen, and MasterStrokes isn't smart enough to click the Zoom box if it's not where it was when you recorded. Extra points to QuicKeys and Tempo for having common sense in checkbox- and button-clicking operations.

AutoMac III	2
MacroMaker	3
MasterStrokes	1
QuicKeys²	5
Tempo II	4

Keyboard Skills

MasterStrokes makes it easy to call up boilerplate text, because remembering your own abbreviation is easier than remembering a key combination. Tempo even has boilerplate graphics, and you don't have to type the text again to create the macro. QuicKeys limits text length to 256 characters (although you can string several together), but it has terrific built-in date-stamping; the remaining programs have to watch you type the full text.

AutoMac III	3
MacroMaker	3
MasterStrokes	5
QuicKeys²	5
Tempo II	5

Multistep Macros and Looping

All five programs handle multistep macros gracefully; MacroMaker and MasterStrokes, however, don't let you edit those macros once you've created them. Tempo II's built-in brains handle looping with aplomb. MacroMaker and AutoMac can loop a few times; QuicKeys' Timer feature can do a pseudo-loop; and MasterStrokes—well, you don't want to try looping with MasterStrokes.

AutoMac III	2
MacroMaker	1
MasterStrokes	1
QuicKeys²	5
Tempo II	5

a macro that can repeat itself, looping until the task is complete.

Only Tempo II Plus is designed for looping. With one keystroke, its Play By Name dialog box appears; in it you can play a macro simply by typing its name. In the same box, there's a "Play the macro __ times" field; just enter the number of times you want the macro to repeat. Indeed, Tempo has powerful (but technical) *conditional branching* skills; that is, the macro does one thing if one on-screen condition is true, and another thing otherwise. Thus, the macro continues finding and italicizing ship names until it reaches the end of the document, whereupon it simply stops.

The other programs aren't designed to loop. You have to create two macros, each of which ends by invoking the other. That is, the Control-1 macro finds and italicizes the first ship name, then presses Control-2. The Control-2 macro handles the next case, then presses Control-1 . . . and so on.

This works splendidly with MasterStrokes. Trouble is, there's no way to stop the infinite loop. Ultimately, you have to shut off the Mac (in the desk potato's book, a disgraceful waste of effort). MacroMaker automatically stops after about 10 loops, and AutoMac III after about 20—not a bad compromise.

The twin-macros method doesn't work in QuicKeys²—not even once. Fortunately, QuicKeys² has another feature that works almost as well: a Timer option, which can set any macro to run at regular time intervals. If you set your italicizing macro to run once per second, it works almost as fast as Tempo II Plus's self-looping macro. Once again, though, there's no way to stop the mad macro once it's begun. Even if you click to cancel, the looping begins again immediately. You can interrupt the cycle only by opening the QuicKeys² control panel and turning off the Timer feature—workable, perhaps, but inefficient.

Macrobatics Summary

It's tough to criticize AutoMac III and MasterStrokes; after all, they're provided as free helpful bonuses by the makers of nonmacro products. But the desk potato would blanch at AutoMac III's dialog box–intensive interface.

MACROPHILE FEATURES

Company	AutoMac III Microsoft	MacroMaker Apple	MasterStrokes Datadesk	QuicKeys² CE Software	Tempo II Plus Affinity
Price	[2]	Free	[3]	$149.95	$169.95
MENU MANIPULATION					
Menu selection by name	○	○	○	●	●
Menu while pressing ⌘, Shift, and so on	○	○	○	●	●
MOUSE MANEUVERS					
Drag cursor in straight lines	●	●	○	●	●
Reproduce cursor drag exactly	●	○	○	●	●
WINDOW- AND BOX-BRAINS					
Zoom/Close front window anywhere on screen	●	●	○	●	●
Zoom/Close window even if off screen	○	●	○	●	●
Click-only-if-button-is-off option	○	○	○	●	●
KEYBOARD SKILLS					
Date- and time-stamping	○	○	○	●	●
Create text macros without retyping	○	○	○	●	●
Boilerplate graphics	○	○	○	●	●
MULTISTEP MACROS AND LOOPING					
Editable multistep macros	●	○	○	●	●
Interruptible macros	●	●	○	●	●
Conditional branching	○	○	○	○	●
Controlled looping	○	○	○	○	●
Nested macros	○	○	○	●	●
OTHER STUFF					
How to play macro[4]	B,D	D,E	D	A,D,F,G	B,C,D,E,G,H
Play a macro at start-up	●	○	○	●	●
File/Application launching	○	○	○	●	●
Playback: real-time or fast only	either[5]	fast only	fast only	either[5]	either[6]
External "plug-in" features	○	○	○	●	●
Printable keyboard overlays	○	○	○	●	○
Display alert boxes/pause for user input	●/●	○/○	○/○	●/●	●/●
Recognizes Control key/Function keys	○/○	●/●	○/●	●/●	●/●
Permits unmodified letter keystrokes	●	●	○	●	○
Sound capabilities	beeps	○	○	any sound file	any sound file
Timed-release macros	●	○	○	●	●
Number of dialog boxes encountered to create one macro	3	1	1	2	1
Permits global (any-program) macros	○	●	●	●	●

● = yes; ○ = no or none. [1] Formerly sold as separate packages, Tempo II and Tempo+ Tools. [2] Bundled with Microsoft Word. [3] Bundled with Datadesk 101 keyboards. [4] A=Apple menu, B=dialog box, C=Finder icon, D=keystroke, E=menu, F=pop-up macro list, G=timer, H=type macro name. [5] Real-time and fast playback may not be combined in one macro. [6] Real-time and fast playback may be combined in one macro.

And remember that AutoMac III won't let you assign macros to the row of function keys or the Control key; that takes away half the fun of macro making. MasterStrokes has one or two terrific features—for example, that boilerplate text feature is glorious. But too many tasks fall into MasterStrokes' can't-do-it category—everything from mouse drags to file launching.

The other three programs are terrific, but are aimed at different kinds of users. MacroMaker is amazingly underrated. Its ever-present menu means that you never have to memorize your macros (or even give them keystroke assignments). Unlike any other program, MacroMaker has an Info box for each macro for entering in short descriptions. And MacroMaker's is the only interface you could conceivably navigate without a manual. It isn't meant to perform tasks that involve more than menus, clicks, and typing; but it does these with speed, brains, and reliability.

QuicKeys² is a powerful midlevel program. It classifies every Macintosh action as one of about a dozen types: Text, Click, Date/Time, Menu, and so on. On one hand, the controls for all these types clutter QuicKeys²'s interface somewhat. On the other hand, because each step of a macro is identified this way, it is easy to access and edit individual steps of a multistep macro—a crucial capability that MasterStrokes and MacroMaker don't give you. You won't get far without the QuicKeys² manual, but the program is much more flexible and programmable than the simpler programs are.

And finally there's Tempo II Plus. Glancing at the "Macrophile Features" table, you'd think Tempo II Plus can do almost anything. Indeed, it's by far the most powerful, intelligent, and limitless macro program. Because it's so programmable, you can, with patience, create complex macros that perform lengthy overnight tasks; one might, for example, automatically log on to a mainframe at midnight, download data, format it in Word, print it out, and shut down the Mac. No, Tempo II Plus is not for beginners. Its dialog-boxy interface won't win any design awards, and editing macros is more cumbersome than it is in, say, QuicKeys². But more than one lucky soul's database-conversion project or massive document-formatting task has been saved by Tempo II Plus's programmable smarts.

Lifting a Finger

The Golden Rule of Desk Potatoes: If you catch yourself performing a task for the second time today, hand it over to a macro. (Let the list of "Thirty Great Jobs for Macros" give you some ideas.) If you're already using macros, please sit down and observe a moment of laziness in honor of all the cumulative energy you've conserved. And if you're not yet using macros, go get that Utilities disk that came with your Mac, and try out MacroMaker as a first step. That's the one bit of effort you'll be very glad you made. Ⓜ

See *Where to Buy* for contact information.

***David Pogue**, a* Macworld *contributing editor, lives in New York City, where he's writing a high-tech Macintosh thriller. He's still trying to make Control-D run the dishwasher.*

The Electronic Palette

by Deke McClelland

11 COLOR PAINT AND 2 PHOTO-EDITING PROGRAMS CROSS BRUSHES

With the advent of 32-bit QuickDraw, virtual memory, pressure sensitivity, and enhanced image processing features, color paint applications have been transformed from diverting toys into extraordinarily capable tools. Full-color image-editing and image-creation software packages now offer a wide spectrum of traditional and innovative tools and techniques for electronic painting. After seeing the range of possibilities open to you, you might be moved to say the sky's the limit. But you'd be wrong. With a color paint program, you can edit the sky too.

Serious Painting, Serious Storage

If you're serious about color painting, there's no substitute for a true-color, 24-bit system and its 16.8 million colors—provided, of course, you can afford it. The software itself is not necessarily expensive. Delta Tao Software's Color MacCheese, for example, a limited but adequate 24-bit paint program, can be had for under $100. But be prepared to hock your inheritance on the hardware.

The first pieces of equipment you'll need are a bigger hard drive and a backup system. True-color paintings are disk hogs. At the typical 72-dots-per-inch screen resolution, an 8½-by-11-inch RGB image can take up as much as 1.5MB of space on a hard drive. Increase the resolution to 300 dpi, and the image soars to nearly 25MB.

Lots of memory is also a necessity. Of the 11 color paint programs reviewed here, only Electronic Arts' Studio/32 uses disk-based virtual memory to edit images that are larger in size than the available RAM (for a comparison of Adobe Photoshop and ColorStudio, see "Want My Real Opinion?"). Less expensive programs require that you load an entire painting into RAM before working on it, which severely limits the kinds of paintings you can produce. A 4MB system allows you to create low-resolution, letter-size paintings; an 8MB system, not running MultiFinder, gives you the most flexible working environment.

Together, a 24-bit video card and a compatible monitor can cost about $2000 more than their 8-bit counterparts. However, three paint programs—Color MacCheese, Zedcor's DeskPaint, and Studio/32—allow you to access 24-bit color using an 8-bit system. With 32-bit QuickDraw installed in the System folder, pixels are automatically dithered to simulate colors that cannot be displayed on screen. The display isn't perfect, since you can't see exactly what you're painting, but images can be saved to disk and printed as 24-bit paintings.

The Perfect Toolbox

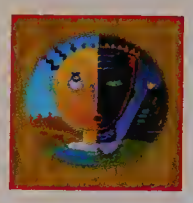
Most color paint programs are remarkably similar in terms of general features and interface, unlike, for example, desktop publishing applications, which vary widely. The best color paint programs are those based on the now-familiar set of tools and functions introduced in MacPaint, so you can get up and running with them in a relatively short period of time.

MicroIllusions' Photon Paint is a notable exception. The program lacks such hallmark tools as the pencil, eraser, and grabber hand. Its toolbox, which consumes an enormous portion of the screen, contains a collection of squiggles, line graphs, and peacocks (really, that *is* what the icon looks like) that are seemingly designed to send the hardiest user scrambling for the manual. But because the manual lacks even a single illustration, hours into using the software you may be left wondering which icon does what.

Oddball tools—tools that appear familiar but don't perform as expected—can also be frustrating. Olduvai's VideoPaint (offspring of the bizarre GraphistPaint) and SuperMac's PixelPaint Professional, for instance, have pencil tools that don't erase in a normal fashion.

Another tool that varies widely from program to program is the airbrush. MacPaint's airbrush (known

as the spray can) sprays a fixed pattern of dots, and only when you drag the cursor. Other programs offer a well-implemented airbrush tool that sprays a continuous random pattern of dots. If you pause while still pressing the mouse button, paint continues to be applied, much as if you're using an actual airbrush. Of the programs reviewed here, only Creative Software's Easy Color Paint, Preferred Publishers' MasterColor (previously CA-Cricket Color Paint), and Olduvai Corporation's VideoPaint lack such well-implemented airbrushes. Easy Color Paint's airbrush is even worse than MacPaint's. Though MacPaint's sprays a constant pattern, it skips every other pixel regardless of how slowly you drag, lending your airbrushed patterns a random appearance. Easy Color Paint doesn't skip every other pixel, so dragging its airbrush tool slowly produces an unbroken line that bears little resemblance to shading. MasterColor's airbrush is identical to MacPaint's. But the program also provides a fully customizable texture tool that paints both randomly and continuously with a variety of multicolor splatters. VideoPaint's airbrush tool allows you to control the shape and size of individual dots and lines in the airbrush pattern, but it does not operate continuously; it applies color only when the tool is dragged.



Taken as a whole, the best toolboxes are those available in Studio/8 and Studio/32 and the PixelPaints (both 2.1 and Professional). Rather than presenting huge and sometimes confusing collections of tools—as MasterColor and Deneba Software's UltraPaint do—the Studios and PixelPaints offer medium-size toolboxes with extensive modification options. In special-effects mode in PixelPaint Professional and PixelPaint 2.1, selecting a tool brings up a custom menu complete with options for applying cycling colors and gradation. In the Studios, you select modification options from special pop-up menus below the toolbox, each of which may be toggled from the keyboard even as you're using a tool. For example, while you are using the paintbrush tool, pressing 2 on the numeric keypad changes the brushstroke from opaque to tinted (semitransparent); if you're painting with a pattern, pressing 2 a second time makes the white portions of the pattern transparent. You can make all these changes without breaking your stroke or concentration.

Colorful Demands

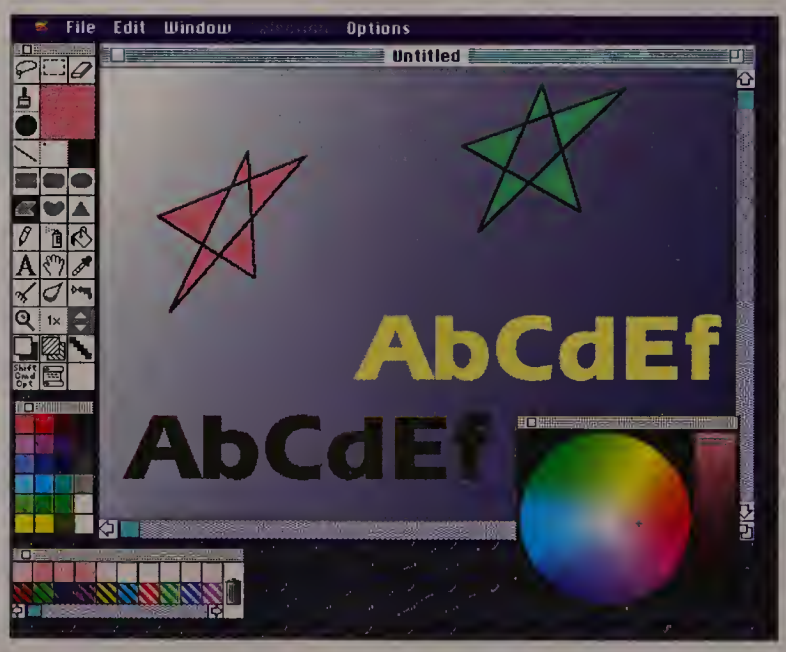
Color increases the range and quality of a painting more than any other single element does. However, color also complicates your work by introducing additional tool requirements. For example, you need to be able to select colors quickly both from a palette and directly from the page. All 11 color paint applications reviewed here solve this problem by offering a dropper tool. Clicking on a color in a painting makes that color the foreground color (the color currently applied by most painting tools). Most programs also allow you to temporarily access the dropper from the keyboard, so you don't have to move the mouse back and forth between the drawing window and the toolbox to change colors. Only DeskPaint and Photon Paint fail to provide temporary keyboard access to the dropper tool.

Even though paint programs create only bitmapped documents, color paint offers a way to avoid the jagged edges normally associated with bitmapped artwork. By blending pixels along the borders between contrasting colors, you can blur jagged edges, making the transitions appear softer and more natural. The most common means for accomplishing this is antialiasing, which blends the edges of a line or character of type as it is applied to the page. Some programs, like UltraPaint, DeskPaint, and DeskDraw, provide charcoal tools that let you draw free-form lines with blurred edges. Studio/32, VideoPaint, and MasterColor also have special antialias brush tools. Better yet, Studio/32, Color MacCheese, and PixelPaint Professional offer antialias modifiers that affect the creation of geometric lines and shapes as well as type (see "Smoothing the Jagged Beast").

With the exceptions of Studio/32 and UltraPaint, which provide special layers for creating and modifying object-oriented text, color paint programs print only bitmapped text, so what you see on screen is exactly what you get on paper.

However, if you use Adobe Type Manager in combination with one of the three color paint programs that offer antialias type—Studio/32, Color MacCheese, and PixelPaint Pro—large type may appear quite smooth and readable when printed. ATM optimizes the appearance of on-screen type based on printer-font information; antialiasing blends the remaining jagged edges of the letters more smoothly into the background of an image.

After using the standard painting tools to apply colors, you may want to blend colors on screen using a smudge tool, offered by all the programs reviewed here except Photon Paint, PixelPaint 2.1, Color MacCheese, and Easy Color Paint. Unlike real paint, which sets as it



Smoothing the Jagged Beast Color MacCheese's antialias modifier (the jagged line in the lower-right corner of the toolbox) controls the appearance of type and geometric lines and shapes. When the modifier is activated, pixels around the border of an object are blended with background colors to give the image a softer, more natural appearance. Compare the untreated text and star on the left with their antialiased counterparts on the right.

dries, electronic paint may forever be manipulated. It is "dry" or "wet" depending on the whim of the user and the prowess of the programmer. The smudge tool picks up color from one portion of the painting and smears it onto neighboring pixels, much as if the colors were finger paints. Indeed, the process is so much like the finger painting of yesteryear that the smudge tool commonly appears as a finger pointed toward the page.

For users with a keen interest in more advanced image processing features, VideoPaint, UltraPaint, and the two PixelPaints provide Blur and Sharpen commands for filtering the appearance of a large selected area. For experienced users who require a higher degree of control and accuracy, Studio/32 offers both a blur tool and a sharpen tool, for precise work on small areas of a painting. The blur tool, represented by a water drop, acts like an antialiasing tool that you use after creating a painting, to smooth existing images and soften contrasting pixels. The sharpen tool increases the contrast between pixels and is especially useful for bringing fine details into sharper focus.

Selecting is another operation that takes on new meaning in a color paint program. Suppose that you want to select the image of a daisy that appears against a grassy background. Somehow you have to isolate the whites and yellows of the flower from the greens and browns of its surroundings. If you have a steady hand, you can simply lasso the flower by carefully tracing its outline. But if you've ever tried to clip an image from a photograph, you know how unsuccessful and damaging such free-form selection can be. For this reason, many high-end paint applications offer several ways to select areas in a painting.

Studio/32 and UltraPaint have magic wand tools, which select a contiguous area of pixels whose colors fall within a specified range. As an example, consider a scanned image of Alan Bates's face. While the pixels that make up his hair are not colored uniformly, they are colored similarly—certainly they are similar enough to be easily distinguished from his face. To select only the hair, click on a series

WANT MY REAL OPINION?

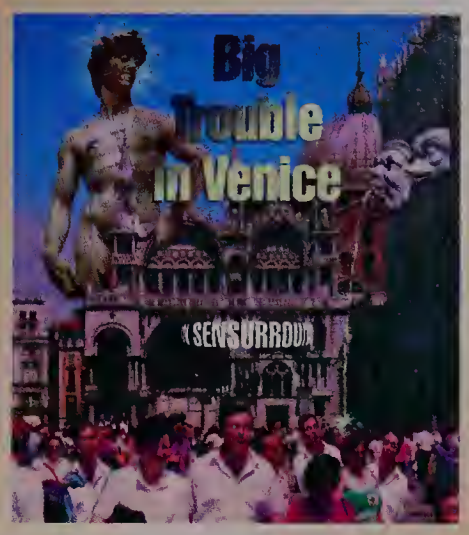
If you're serious about color painting take my advice and part with a few extra bucks to buy a full-fledged color photo-editing package. ColorStudio and Adobe Photoshop, the most powerful examples, sell for about $300 more than either PixelPaint Pro or Studio/32. Although they lack tools for creating geometric shapes like rectangles and ovals, both are far superior products for many high-end color paint projects. Both Photoshop and ColorStudio provide 24-bit color using an 8-bit monitor; virtual memory; a slew of useful image-editing filters; full contrast, brightness, and color balance control; antialiasing; and pressure sensitivity. In addition, both offer exacting control when creating four-color separations, and they provide direct support for scanners (see "Real to Realer").

Deciding between the two, however, is a difficult proposition for the discerning artist. ColorStudio offers an extremely versatile collection of drawing tools and brush shapes. The program also allows you to customize brush shapes, which can be saved and transferred to other versions of ColorStudio as annex files—special resources that can include separation modules and image-editing filters. From an electronic painter's perspective, ColorStudio's greatest strength over Photoshop may be the Shapes annex, a collection of object-oriented tools and commands that rival those of dedicated drawing programs such as Adobe Illustrator and Aldus FreeHand. Like Illustrator 3.0, ColorStudio's Shapes allows you to reshape PostScript type outlines to create logos and other specialized letterforms.

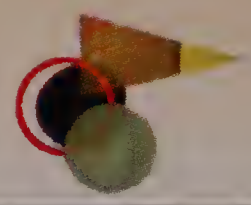
Unfortunately, while it's a dramatic improvement over its predecessor in many ways, ColorStudio 1.11 has inherited two frustrating ancestral traits. First, it demands 5MB of RAM to run—more than twice as much memory as Photoshop requires—preventing many users from operating ColorStudio under MultiFinder. And second, the program has a cumbersome user interface, cluttered with complicated dialog boxes.

Photoshop, on the other hand, delivers high-powered painting prowess in a substantially simplified format. A highlight among Photoshop's points of painting interest is the magic eraser tool, which selectively reverts portions of a painting to their previously saved appearance. ColorStudio lacks even a standard eraser. What's more, Photoshop offers versatile transformation commands and straightforward masking control in which selections act as editing stencils. These features are present but less intuitive in ColorStudio.

But regardless of which program you choose—ColorStudio or, my favorite, Photoshop—there's no getting around the fact that these two image-editing applications double as the best color paint programs on the market.



Real to Realer This 28MB painting features images from three different photographs scanned using an Epson ES-300C. Of the 24-bit programs currently available for the Mac, only a handful provide both image-editing and color-separation capabilities. Of these, your best bet for creating this sort of artwork is a dedicated color image-editing application such as Adobe Photoshop.



COLOR PAINT CONTRASTS

COLOR PAINT PROGRAMS

	Color MacCheese 2.0	DeskPaint & DeskDraw 3.03	Easy Color Paint 2.0	MasterColor 1.0	Photon Paint 1.1.1	PixelPaint 2.1
Company	Delta Tao Software	Zedcor	Creative Software	Preferred Publishers	MicroIllusions	SuperMac Technology
List price	$99	$199.95	$89	$199.95	$149.95	$249
GENERAL FEATURES						
Opens multiple paintings	●	●	○	●	●	○
Supports PICT/TIFF	●/●	●/●	●/● [1]	●/○	●/○	●/● [2]
Supports MacPaint/EPS	●/● [3]	●/○	●/○	● [3]/○	○/○	●/●
Maximum painting size (in pixels)	[5]	4000 by 4000	[5]	1024 by 1024	[5]	1024 by 1024
Direct scanner support	○	○	○	○	○	●
Prints color separations	○	○	○	○	○	process, spot
Halftone screen frequency control	○	○	○	○	○	●
COLOR						
24-bit color	●	●	○	○	●	○
Key colors per gradient	2	2	2 [6]	2	2	2
Pantone color support	○	○	○	○	○	●
Color editing modes	RGB	HSL, RGB	HSL, RGB	HSL, RGB	HSL, RGB	CMYK, HSL, RGB
NTSC gamma correction	○	○	○	○	○	●
32-bit alpha channel control	○	○	○	○	○	○
PAINTING TOOLS						
Bezier curves	○	○	○	●	○	uneditable
Antialias line control	●	●	○	○	○	○
Editable multicolor patterns	●	○	●	○	●	○
Adjustable paint opacity	●	●	○	○	●	○
Paint on lighter or darker colors only	○	○	○	○	○	●
Antialias brush control/charcoal tool	○	●	○	●	○	○
Adjustable airbrush size/flow	●/●	●/●	NA	●/●	●/○	●/●
Airbrush splatter control	○	○	NA	●	○	●
Image-editing tools	blur	smudge	○	blur, smudge	○	○
Pressure sensitivity	○	○	●	○	○	○
Object-oriented drawing tools	○	DeskDraw only	○	○	○	○
TEXT HANDLING						
Antialias type control	●	○	○	○	○	○
Supports multiple fonts and sizes in text block	○	●	○	●	●	○
Maximum type size (in pixels)	[7]	127	127	72	255	255
Object-oriented text capabilities	○	DeskDraw only	○	○	○	○
SELECTION CAPABILITIES						
Magic wand selection	○	○	○	○	○	○
Select shape from inside	●	○	●	○	○	●
Autoslip lasso control	○	●	○	○	○	○
Select noncontiguous areas	●	○	●	○	●	●
Select/reshape most recent object	○/○	○/○	○/○	●/●	○/○	●/○
Add or subtract to selected area	○	○	○	○	○	○
IMAGE-EDITING FEATURES						
Mask objects/colors	○/○	○/○	○/○	○/○	○/○	●/○
Nudge selection one pixel	○	●	●	●	○	○
Resize selection by percent	○	●	○	○	●	○
Wrap selection onto shape	○	○	○	○	●	○
Project light source on selection	○	○	○	○	●	○
Image-editing filters	1	9	0	2	1	10

● = *yes,* ○ = *no, none.* [1] *Saves in monochrome TIFF only.* [2] *Saves in gray-scale TIFF only.* [3] *Opens only.* [4] *Saves only.* [5] *Limited only by available memory.*

					PHOTO-EDITING PROGRAMS	
PixelPaint Professional 1.0	**Studio/8 2.0**	**Studio/32 1.0**	**UltraPaint 1.0**	**VideoPaint 1.0**	**Adobe Photoshop 1.0.7**	**ColorStudio 1.11**
SuperMac Technology	Electronic Arts	Electronic Arts	Deneba Software	Olduvai	Adobe Systems	Letraset Graphic Design Software
$699	$295	$695	$199	$495	$895	$995
○	●	●	●	○	●	●
●/●	●/●	●/●	●/●	●/●	●/●	●/●
●/●	● [3]/○	● [3]/●	●/○	● [3]/● [4]	●/●	○/● [4]
1024 by 1024	4096 by 4096	[5]	7700 by 7700	2048 by 2048	[5]	[5]
●	○	○	○	○	●	●
process, spot	○	○	○	process	process	process
●	○	○	○	●	●	●
●	○	●	○	●	●	●
2	32	32	2	2	2	2
●	●	●	○	○	○	●
CMYK, HSL, RGB	CMY, HSL, RGB	CMYK, HSL, RGB	CMYK, HSL, RGB	HSL, RGB	CMYK, HSL, RGB	CMYK, HSL, RGB
●	○	○	○	○	●	●
○	○	●	○	○	○	○
uneditable	●	●	●	○	○	●
●	○	●	○	○	●	●
○	○	○	○	○	●	●
●	●	●	●	●	●	●
○	●	●	○	●	●	○
○	○	●	●	●	●	●
●/●	●/●	●/●	●/●	NA	●/●	●/●
●	○	○	●	NA	○	○
blur, smudge	smudge	blur, sharpen, smudge	blur, smudge	blur, smudge	blur, sharpen, smudge	blur, sharpen, smudge
○	○	●	●	○	●	●
○	○	○	●	○	○	●
●	○	●	○	○	●	●
○	●	●	●	○	○	○
255	127	[7]	127	128	1000	300
○	○	●	●	○	○	●
○	○	●	●	○	●	●
●	●	●	○	●	○	●
●	●	●	○	○	○	○
●	●	●	●	●	●	●
●/○	●/●	●/●	●/● [8]	○/○	○/○	○/○
○	○	●	○	○	add only	○
●/○	●/●	●/●	●/○	○/●	●/○	●/○
○	●	●	●	○	●	●
○	●	●	○	○	● [9]	●
○	○	sphere only	○	●	sphere only	○
○	○	○	○	●	○	○
9	3	6	7	9	28	14

[6] Gradients may fill selected area only. *[7] Unrestricted.* *[8] In drawing layer only.* *[9] Applicable to entire image only.*

of representative pixels with the magic wand tool. A range of similarly colored contiguous pixels becomes selected. If portions of the face become selected, specify a smaller range. If the selection misses some follicular pixels, increase the range.

Another selection method, auto-slip lasso control, is offered by DeskPaint (the program calls it masking), PixelPaint Professional, and the two Studios. In contrast to a magic wand, this feature allows you to define the colors that should be exempt from a selection. If you drag across the green and brown areas around the daisy, for example, the program ignores all green and brown pixels and selects only the whites and yellows inside the lassoed area—the daisy itself.

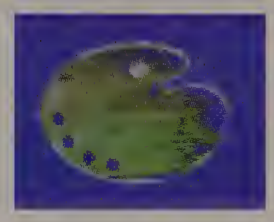
Some Very Special Effects

If you're looking for razzle-dazzle, you'll find much to admire in the new crop of color paint software. VideoPaint and Photon Paint are perhaps the most powerful applications in the special-effects arena, although they have their share of special difficulties too. Both programs enable you to wrap selected images onto spheres, cones, cubes, and other three-dimensional objects. You may also define a light source, the angle of light, and diffusion rate with these two programs. The problem is that the results are long in the making and extremely difficult to predict. On a Mac II, a standard surface-mapping command can take as long as five minutes to complete. If you're unhappy with the results (which I found to be a common experience), you have to choose Undo and start all over again.

If you're too impatient to withstand the slings and errors of the special-effects programs, you might prefer to settle for the less dramatic Studio/32. Studio/32 allows you to wrap a selection onto a sphere, though you cannot define a light source. You can also create a 3-D montage of repeating perspective tiles (see "The Ideal Linoleum"). The effect is time-consuming, but more predictable than the surface mapping offered by other programs.

Printing Your Painting

All right, color paintings look great, but what good are they? What can you do with the final image? Unfortunately, this is the biggest failing of the majority of color paint applications. If you're on a budget, you can print monochrome halftones or color composites on PostScript-compatible output devices, and use photocopies to create multiple copies for fliers or other informal documents.



But only VideoPaint and the two PixelPaint packages provide the color-separation capabilities and the halftone screen frequency control required for professional offset printing. PixelPaint 2.1 and PixelPaint Professional display comprehensive print dialog boxes that allow you to choose both process-color and spot-color separations. In VideoPaint, you have to save your painting as four PostScript-language separation files—one each for the cyan, the magenta, the yellow, and the black components. You then download each of these to a PostScript-compatible printer. It's time-consuming, but at least it works.

While lacking direct color-separation capabilities, UltraPaint, Studio/8, Studio/32, and DeskPaint do allow you to save images as color TIFF documents, which you can then separate with other programs, such as Aldus PrePrint, Adobe Photoshop, or Letraset ColorStudio.

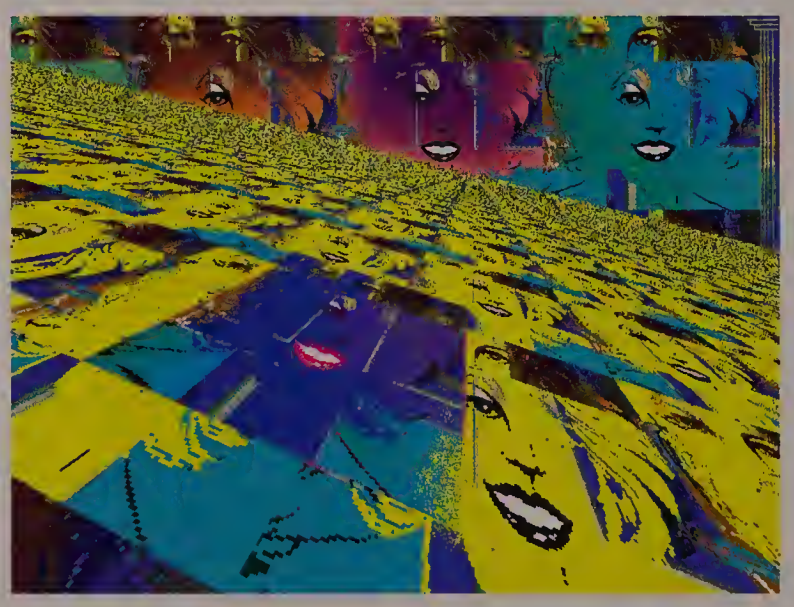
If you're more interested in video than in print output, you can save your artwork as a PICT file—the only format supported by all 11 color paint programs—and import it to a presentation program such as Aldus Persuasion or use it as a background in a full-blown animation application such as MacroMind Director.

The Final Touches

So when all is said and done, what's the best color painting program? It really depends on how much money you want to spend. If you can't justify spending more than $100, I recommend Color MacCheese over its slightly less expensive rival, Easy Color Paint. Color MacCheese offers 24-bit color, all the expected tools, an adequate collection of anti-aliasing features, and limited image-editing features, certainly enough for the casual user. The manual is next to worthless, but the program comes with a hand-painted box and some Taoist philosophy thrown in.

If it weren't for the existence of the very inexpensive Color MacCheese and Easy Color Paint, PixelPaint 2.1 and Studio/8 would be reasonable deals for under $300. But as it is, I can't recommend any program in the $100-to-$500 range except for the $199 UltraPaint—and that only because UltraPaint provides a drawing layer complete with a set of object-oriented tools.

If your idea of painting includes photo editing, painterly drawing control, and an occasional color separation, you should consider shelling out $700 for a top-of-the-line program. Insofar as a pure drawing experience is concerned, Studio/32 is my personal favorite. It provides pressure sensitivity (see "As If That Weren't Enough") and a host of fine drawing-modification controls that make on-screen painting a real pleasure. Studio/32 also offers access to Apple's alpha channel. But Studio/32



The Ideal Linoleum Studio/8 and Studio/32 both offer a Fill Perspective Plane command that repeats a selection to a specified horizon as if laying floor tiles. The central blue tile was positioned using the standard Perspective command, thereby matching the angle and depth of the repeated tiles.

AS IF THAT WEREN'T ENOUGH

Having seen the future of color bitmap software, I can tell you that it begins with pressure sensitivity and ends (at least for now) with Time Arts' new paint package Oasis.

The Wacom tablet, with its two pressure-sensitive styluses, does everything a mouse does and more. Used with some paint programs, it responds to variations in the pressure you apply, letting you create naturalistic images that look for all the world like watercolors or oils.

Presently, a handful of paint programs support the Wacom pressure-sensitive tablet. The best of these—Studio/32, UltraPaint, ColorStudio, and Adobe Photoshop—allow you to vary line thickness by pressing harder or softer as you move the stylus. As you gradually release the stylus, the line tapers to a soft, delicate tip.

Several new programs, not yet shipping at press time, will also support the Wacom tablet. These include VideoPaint Pro, scheduled to ship in mid-1991; PixelPaint Professional 2.0, the new heavyweight contender from SuperMac; StrataVision Paint, the first program to address 64-bit color; and Oasis, the Mac version of the much-respected Lumena for IBM PCs and compatibles.

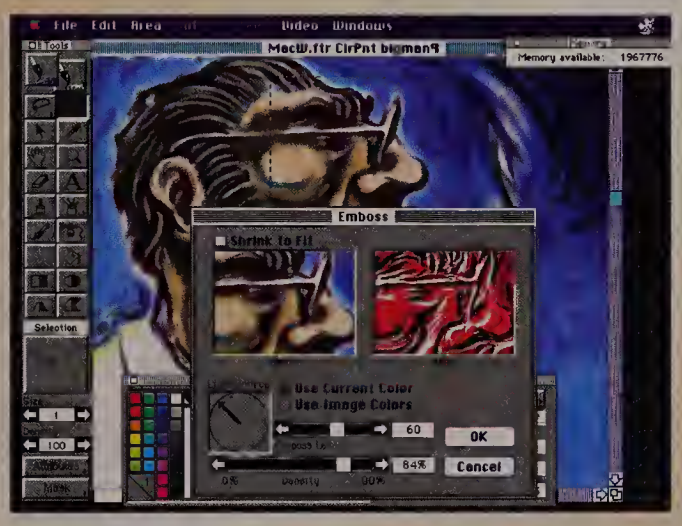
Of these, only Oasis will allow the user to specify how the pressure-sensitive data is to be interpreted. You will be able to direct the pressure to affect the size of the cursor, as is common in most programs; the density of the ink; the color of the ink, as selected from the current gradation; or all three at once. Using the antialias brush tool, you will even be able to use pressure to determine the "wetness" of the brush. As you release the stylus, the ink will "dry" slightly to produce a coarser line.

Oasis will also offer several image-editing filters. After you select the portion of the painting to be affected and choose a filter command from the Area menu, a preview dialog box will appear, enabling you to preview the consequences of your changes before you apply the filter (see "A Pressing Future").

Oasis will also include a standalone video module designed to assist the transfer of RGB images to videotape and overlay computer-created type and graphics onto live video images. Real-time antialiasing will also be available. Oasis will be priced under $800, less than either Photoshop or ColorStudio.

The comparably priced PixelPaint Professional 2.0 promises to give Oasis a run for its money. In addition to pressure sensitivity, PixelPaint Pro 2.0 will offer virtual memory, semitransparent masking, and a special dialog box for defining multicolor gradients. The new WetPaint feature will allow you to select and modify an image before integrating it into the painting (much like the FreshPaint feature pioneered by Cricket Paint and now found in MasterColor). Most alluring of all will be the integration of PixelPaper, a feature that will let you determine the texture of the surface on which you paint.

You say 16.8 million colors just doesn't hack it? It may sound ridiculous, but StrataVision Paint will provide access to 282 *trillion* colors, well beyond the capabilities of existing hardware. But never fear, users with 8- and 24-bit systems will be able to use StrataVision Paint to create full-color paintings while they wait for the technology to catch up with the program. Specifically designed to be compatible with the upcoming System 7.0, StrataVision Paint will ship in January for $695 retail, slightly less than either PixelPaint Pro 2.0 or Oasis.



A Pressing Future This image was created in Photoshop using the Wacom tablet with a pressure-sensitive, cordless stylus. The image was then opened in a prerelease version of TimeArts' Oasis, which allows you to dynamically preview filter commands before applying them to a painting.

doesn't provide any color-separation capability, which means that you'll have to transfer your images to another program that does. If you need one program that does both color paint and color separations, get PixelPaint Professional instead. It won't make you hoot and holler, but it's more than adequate for creating professional-quality artwork. PixelPaint Professional also offers several image-editing filters and a few airbrushing effects missing from Studio/32. But most important, PixelPaint Pro offers 24-bit color control, as well as spot and process color-separation features required by a professional painter. M

See *Where to Buy* for contact information.

Deke McClelland *is a writer in Boulder, Colorado. His recent books include* Painting on the Macintosh *(1989)*, Drawing on the Macintosh *(1990), and* Mastering Adobe Illustrator, Macintosh version 3.0 *(1991) (Business One Irwin) as well as the* Encyclopedia Macintosh.

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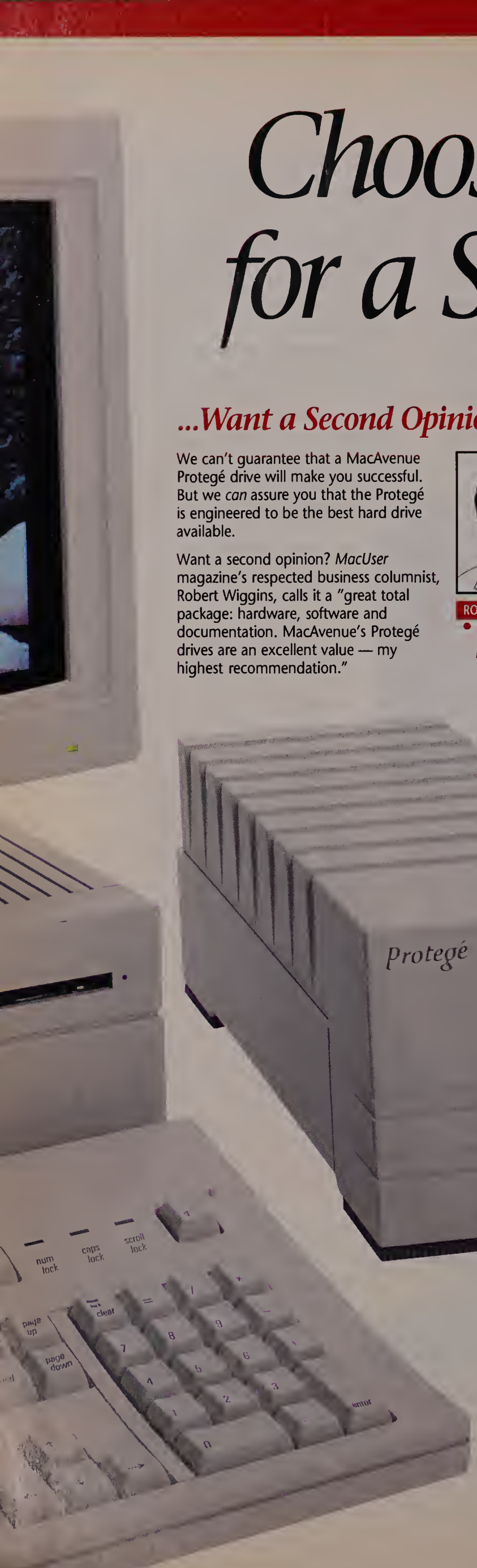

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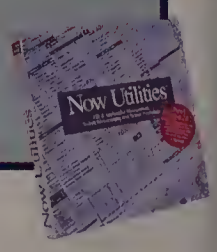

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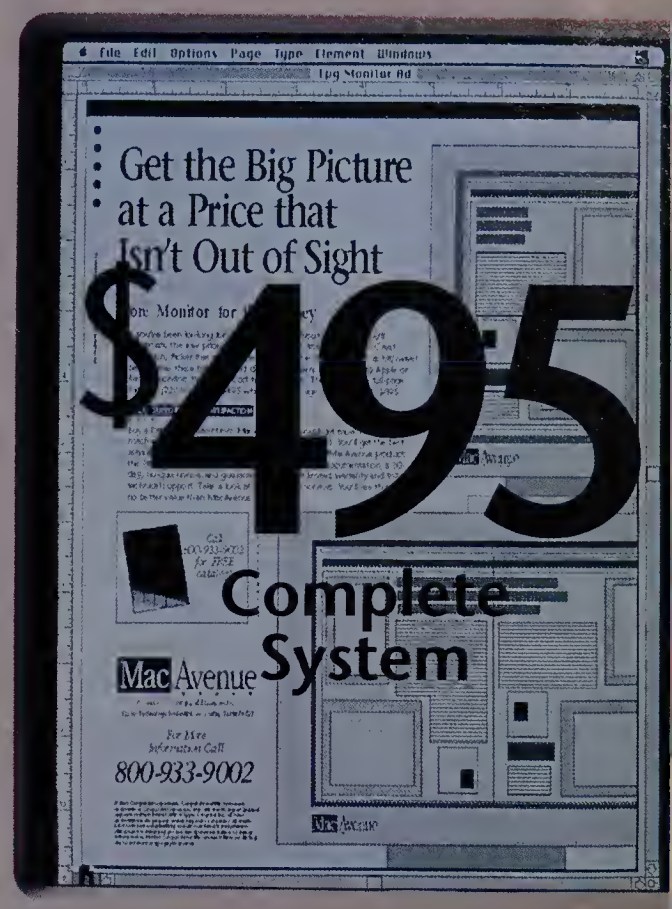

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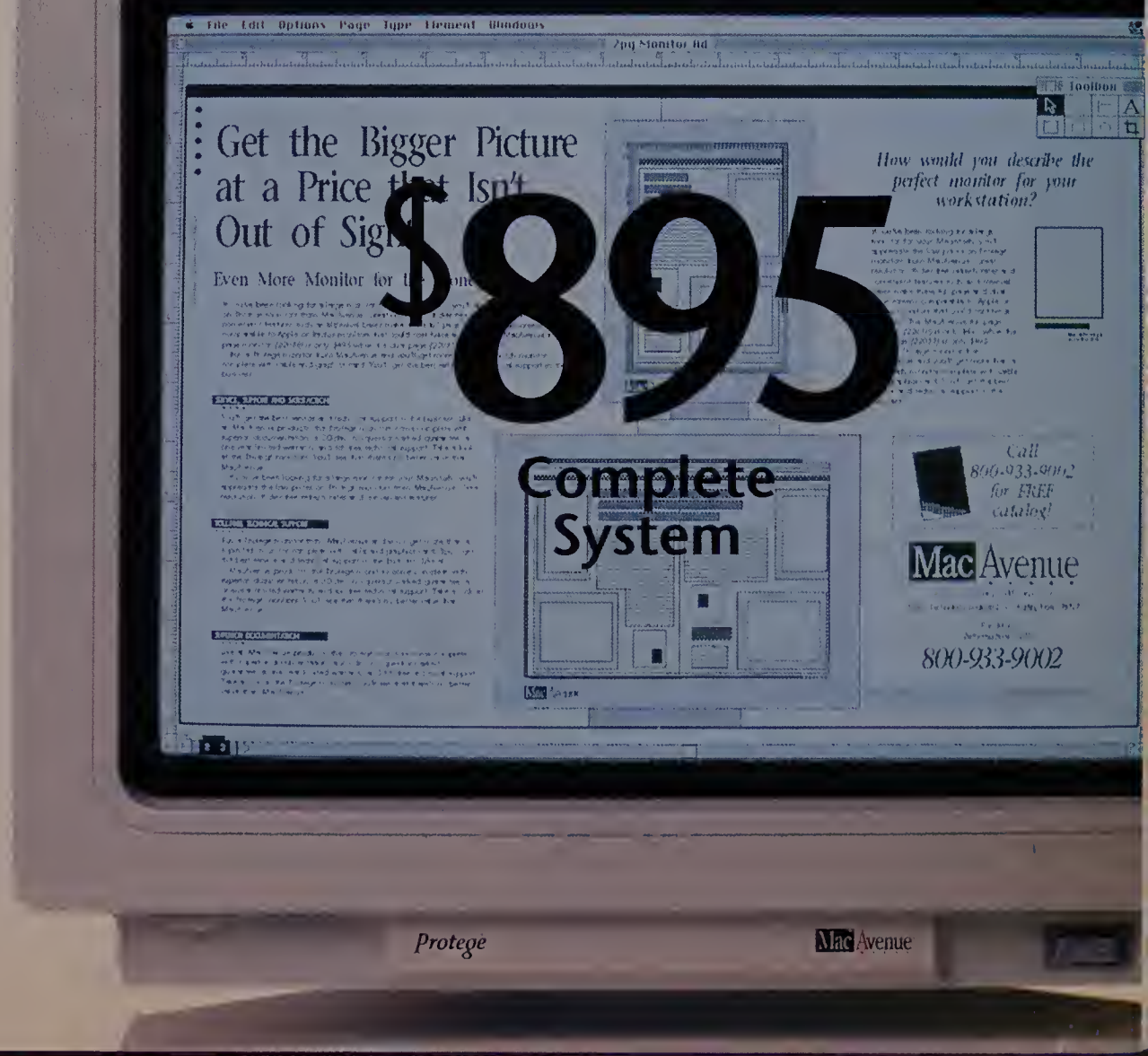

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REVIEWS

Professional Paint Program

STUDIO/32 1.0

Pros: 24-bit color capabilities; support for virtual memory, Pantone Matching System, and pressure-sensitive tablets; antialiasing; superb selection control; special text layer for creating fully editable, high-resolution type; modifiable, intuitive interface. **Cons:** Can't generate color separations; can't alter size of existing document; overpriced. **Company:** Electronic Arts. **Requires:** Mac II; 2MB of RAM; color monitor. Recommended: hard drive; 5MB of RAM and 24- or 32-bit video board to work in 32-bit mode. **List price:** $695.

DON WOO

Since most painting programs are based on the common MacPaint model, they are essentially easy to use. A typical user can sit down and start painting right away, without having to spend hours sifting through a manual. But when you get ready to tackle the intermediate and advanced features—masking, transformation effects, color control—many high-end paint programs lurch wildly into a meandering bog of bizarre menu commands and unfathomable dialog boxes. Studio/32 is a wonderful exception. Happily, the program starts out easy to use and becomes even more predictable as you become increasingly familiar with it. Every feature has been implemented logically and with careful attention to convenience and versatility.

Tools and Modifiers

Cut and dried, Studio/32 is a 24-bit upgrade to Studio/8, the two-year-old 256-color paint program also from Electronic Arts. If you've used Studio/8, you're already familiar with the basic interface. The toolbox features a collection of standard painting and image-editing tools followed by a handful of pop-up icons that modify the tools' actions. All tools can be accessed from the keyboard. Pressing 1 through 9 on the keypad toggles the modifier settings.

The ability to access and modify Studio/32's incredible tools from the keyboard is a convenience, and it augments your capacity to control colors and objects. Almost any tool's function can be modified from the keyboard while you are using the tool, or even after you've completed an operation. For example, suppose you want to select and manipulate a complex object independently of its complex background. Studio/32 offers two selection modifiers: the slip colors modifier, used to determine which colors are selected inside a lassoed or marqueed area, and the shrink/expand modifier, which controls whether the selection shrinks to the exact boundary of the selected object, tightens to a rectangular marquee, or expands to include boundaries surrounding the lassoed or marqueed area. Both modifiers can retroactively adjust the confines of the current selection. Together, the slip colors and shrink/expand modifiers offer up to 15 different selection alternatives for each execution of the lasso or marquee tool, making it possible to change your mind several times without so much as touching the mouse.

Beyond the 8th Bit

Because they offer an exponentially wider array of colors, true-color paintings are predictably more intricate than their 8-bit counterparts. Studio/32 has several new capabilities to help rein in the color overload. Foremost among these capabilities are features that offset hardware inadequacies. If you can't quite justify the additional expense of a 24-bit video board, Studio/32 enables you to open and edit 16- and 24-bit images even while you're using a standard 8-bit monitor. Also, Studio/32 is one of the new

generation of Macintosh programs offering disk-based virtual memory. True-color paintings consume a lot of space, both on disk and in your computer's memory. If you don't have the 5 to 8 megabytes of RAM needed to load a large painting, Studio/32 loads what it can and allocates the overflow to an unused space on your hard drive. To save time as well as wear and tear on your hard drive, only as large a portion of the painting as will fit into RAM is displayed in the document window. You can access a hidden portion of the picture by double-clicking on the grabber hand icon in the toolbox to bring up the Show Document window, which displays the entire painting. Move the work area to a new location with respect to the painting, and then press Return to continue.

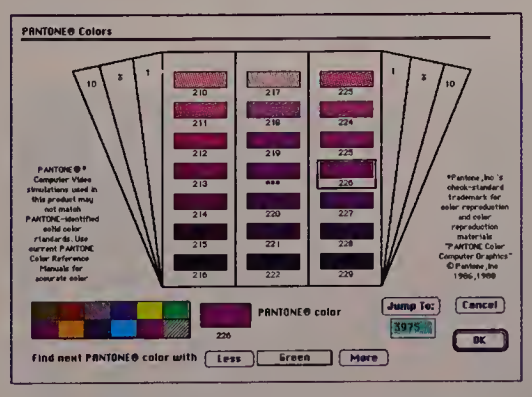
Another 32-bit enhancement is the antialias modifier, which softens the outlines of bitmapped type and geometric shapes by slightly blending pixels around the perimeter of the object. A special antialias brush tool creates soft lines that are further blended as you increase the width of the stroke. A Pressure option, accessed by double-clicking on the antialias brush icon in the toolbox, allows you to create semitransparent brushstrokes. And if you're keen on creating lines of varying opacities, Studio/32 supports pressure-sensitive input compatible with the Wacom drawing tablet. Press hard on the stylus to get an opaque line; release it gradually to create an increasingly transparent stroke.

For the professional artist, Studio/32 supports unlimited resolutions and page sizes. Even though the program provides no direct scanner support, the program is capable of reading both resolution and document size when opening scanned pictures. (Studio/8 1.0 reads document size only, converting all pictures to 72 dpi, which often results in a loss of detail.) Unfortunately, Studio/32 does not allow you to change the size of an existing document. If you want to enlarge or reduce a painting, you must copy the current picture, alter the new document's default size in the Preferences dialog box, create the new document, and paste. This seems like a tremendous amount of work to perform such a common and normally simple operation.

Printing Companion

Printing is an area in which Studio/32 at first impresses but ultimately disappoints. For enthusiasts of high-resolution type, Studio/32 offers a special text layer for creating and editing object-oriented text. Type on the text layer is forever editable and will print from Studio/32 to PostScript and TrueType printers at full resolution, relying on the printer font definition just as drawing and page-layout programs do. However, type on the text layer can only be black and cannot be saved in a format that any other program will recognize. Unless you require small type for labeling an image, it's more fun to apply text to the paint layer, where you can color, antialias, and manipulate it using standard paint tools.

Uncommon Tutankhamen Studio/32's unique interface makes it as useful for painting as for image editing. This montage was produced by duplicating and transforming several scanned images and augmenting them using carefully modified painting tools. Note that the text is bitmapped, having been applied to the paint layer. The letters were enhanced by masking the area around the text and manipulating the unmasked area using the pencil, smear, and antialias brush tools.



Pantone Paradise Studio/32 provides an enormous dialog box for accessing and selecting Pantone colors. Three cards are shown at a time, each matching a card in the Pantone color formula guide. Though Studio/32's Pantone support is versatile, its ultimate utility is questionable, since the program cannot generate color separations.

Studio/32 offers full on-screen support for the 747-color Pantone Matching System. The interface for selecting and using Pantone colors is truly exceptional, allowing you to locate colors by number or by color qualities (see "Pantone Paradise"). But here's the clincher: What good is Pantone color support, no matter how cleverly organized, if the program doesn't provide color-separation capabilities? This is Studio/32's great failing—its *only* major failing, really. It has to rely on other programs to produce color separations. Studio/32 paintings can be separated using Adobe Photoshop or Letraset's ColorStudio, or they can even be saved as TIFF files and separated using Aldus PrePrint. But all these options involve the added cost of purchasing separation software or visiting a service bureau. And none of these options let you print high-resolution type saved to the text layer or create spot-color separations, which are necessary for printing true Pantone colors.

Interface Lift

Electronic Arts plans to release Studio/8 2.0, an upgrade to the original 8-bit program, at a price halved to $295. If Studio/32 were priced as competitively, I would heartily recommend it as a companion program for any Macintosh owner interested in creating full-color, bitmapped graphics. But sadly, Studio/32 is not worth $400 more than Studio/8, as the retail price tag might lead you to expect. Make no mistake, Studio/32 is a tremendously enjoyable and reliable painting program that in many ways equals Adobe Photoshop and surpasses PixelPaint Professional. But without support for color separations, direct scanner input, or video output, Studio/32 users have to purchase an additional program to provide input and output and separations. No program is an island, but when I think of parting with $700, I anticipate a painting application that at least pretends to be self-sufficient.

—Deke McClelland

See* Where to Buy *or circle 705 on reader service card.

Digital Recording and Playback Software

DECK 1.03

Pros: Tape deck–like interface; compact disc–quality sound; versatile signal-processing options; automated mix-down settings; allows control from external MIDI faders; allows integration of MIDI sequences and audio. **Cons:** Can't adjust input level during recording; requires fast, high-capacity hard drive; finicky about system configuration; jerky fader movement during playback; copy protected. **Company:** Digidesign. **Requires:** Mac II; 2MB of RAM; hard drive with 28ms access time; Digidesign Audiomedia or Sound Tools hardware; appropriate audio amplifier and sound source. Recommended: 4MB of RAM. **List price:** $349.

One of the hottest trends in today's music world is the personal recording studio. The Mac and other personal computers have fanned the flames, thanks to the Musical Instrument Digital Interface (MIDI) and music software that lets you record, play back, and edit the data that MIDI instruments transmit (see "Getting Started with MIDI," August 1990). As a result, pros and amateurs alike have turned basements and bedrooms into studios whose capabilities would have cost tens of thousands of dollars not long ago.

One cornerstone of most personal studios is a multitrack tape deck, which can record and play back multiple *tracks* of music. By successively recording a different instrument on each track, a single musician can build up complex arrangements. Multitrack decks start at under $500 and use standard audio cassettes to record and play back up to four tracks. They are terrific for fleshing out arrangements and creating demo tapes, but their sound quality is not up to professional audio standards.

Digidesign's Deck uses a Mac's hard drive to record digital sound with the fidelity of a compact disc. Deck also lets you combine digital audio and MIDI information in ways no conventional tape deck can.

Deck costs about as much as the least expensive four-track audio recorder, but you'll also need Digidesign's $995 Audiomedia expansion board, which contains the circuitry needed to translate between audio signals and bits and bytes (see *Reviews, Macworld,* May 1990). You can also use Digidesign's more sophisticated and costlier Sound Tools hardware. And because a Deck recording inhales disk space at a rate of 20MB per minute, you also need a copious hard drive and backup medium. Throw in a Mac II, and you've spent several thousand dollars—a lot for an amateur to spend, but peanuts for pros and school music labs.

In the Studio

Deck's sole screen display is faithful to the multitrack recording metaphor, with volume meters that dance during recording; sliding faders that adjust recording and playback volumes; and transport controls that let you record, play back, fast forward, and rewind (see "Now on Deck"). If you've used conventional multitrack decks, you'll feel at home with most of what you see. And you'll be delighted with some of the differences, such as instantaneous rewinding.

Now on Deck Deck turns the Mac into a multitrack digital audio recorder with automated mix-down features and the ability to import and play back MIDI sequences. Here, track 4 is being recorded while the remaining three tracks play back, and a chorus effect is being applied to track 3.

Recording a track with Deck involves selecting the desired track, adjusting the input volume to avoid clipping (which causes distorted sound), and then clicking on the Record button. After you record one track, you can record additional tracks. If you fill all four tracks and still need more, you can merge two or more tracks into one, freeing the others for reuse. This technique, called bouncing, is often used with conventional multitrack decks, too. But bouncing tracks in the analog world degrades a recording's quality; that doesn't happen with Deck.

Deck also exploits the digital signal processing (DSP) features of the Audiomedia board to enable you to alter the sound of a track during playback. Several digital effects are supported by Deck, ranging from a digital equalizer, which lets you accentuate or attenuate certain frequencies, to a stereoizer, which processes a monophonic recording to simulate stereo.

The MIDI Connection

Deck can import and play back a MIDI composition created using sequencer software such as Opcode Systems' Vision and Mark of the Unicorn's Performer. To include a MIDI sequence in a Deck recording, you save the sequence as a standard MIDI file and then import it into Deck. Thereafter, when you play back your audio recording, Deck also plays the sequence, thereby controlling any MIDI instruments attached to your Mac.

Deck reaches out to the MIDI world in another way: it lets you assign, or map, one or more of Deck's on-screen faders to the physical sliders on a MIDI fader box such as J. L. Cooper Electronics' FaderMaster. (A fader box contains slider knobs that transmit MIDI data when you move them.) With this feature, you can control the playback volume of one or more tracks by moving the sliders on the fader box instead of using Deck's on-screen sliders.

Deck provides some features that enable it to synchronize its playback to industry-standard time-code signals, but these sync features are limited compared to the ones in Digidesign's Sound Designer II software.

(continues)

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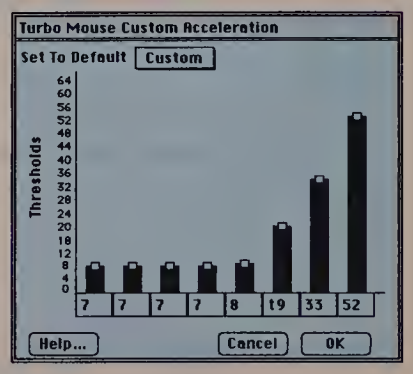

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The Final Mix

The final step in any recording session is the mix-down, which involves adjusting the playback volume of each track while recording in standard two-track stereo on a second deck. As the multitrack recording plays back, a recording engineer often adjusts the volume of certain tracks, changes their apparent location in the left-right stereo spread, and makes other fine adjustments to arrive at the best-sounding final product. Twiddling all those knobs as a piece plays requires some dexterity, and twiddling them in the exact same way each time is all but impossible. For these reasons, professional recording equipment often provides automated mix-down features that "remember" the adjustments the engineer makes so the final mix can be re-created if needed.

Deck brings automated mix-down to the desktop. You can save and restore up to 200 different combinations of fader and effects settings. During playback, Deck's faders and other on-screen knobs move to the appropriate positions by themselves. Automation files are stored separately from the recording itself, letting you apply different automation files to a single recording to see which you prefer.

You can move recording files between Deck and Digidesign's Audiomedia and Sound Designer II software. Deck can also import files saved in the Audio Interchange File Format (AIFF), used by sound-editing programs such as Passport Designs' Alchemy.

On the downside, Deck is a bit finicky. It doesn't coexist well with start-up documents (INITs), especially network and electronic-mail software, which eat into the Mac's processor time. It also requires a fast hard drive (28ms or faster) without a lot of fragmented free space. And because Deck gives priority to playing back at an accurate speed rather than to updating the screen and responding to the mouse, its on-screen faders operate sluggishly, making real-time volume adjustments difficult and frustrating. (An external fader box eliminates this problem.)

In all, Deck is a superb program. No comparably priced analog multitrack tape deck offers Deck's sound quality and automation features, and no tape deck of any price boasts Deck's ability to import and play MIDI sequences. Don't buy any analog multitrack deck until you've seen Deck and the Audiomedia board in action.

—Jim Heid

See **Where to Buy** *or circle 618 on reader service card.*

Educational HyperCard Stack

EARTHQUEST 1.0

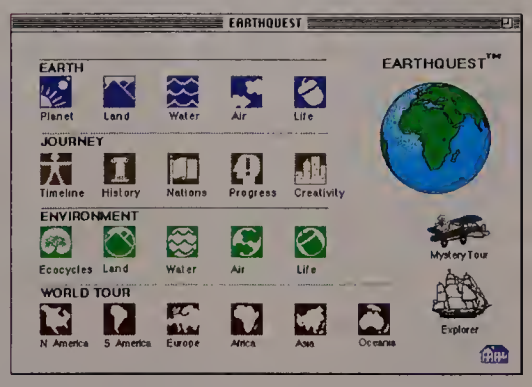
Pros: Interactive hypermedia approach encourages individual exploration; broad in scope; fun. **Cons:** Some rough edges; not fully functional on some 1MB machines. **Company:** Earthquest. **Requires:** Mac Plus; hard drive; System 6.0.2. Recommended: 2MB of RAM. **List price:** $79.95; ten-station Lab Pack $350.

HyperCard and other hypermedia let students explore personal paths through information, rather than being tied to the beginning-to-end approach dictated by most books and videos.

Earthquest is one of the best examples yet of how HyperCard can be used to give students from ten years old to adult a global, rather than parochial, perspective. Instead of presenting the earth from a discipline-specific point of view, Earthquest allows students to simultaneously study natural and human history, ecology, sociology, and geopolitics, exploring the interconnections between these different worldviews in the process.

Earth to Mac

The main menu screen of Earthquest, the Explore card, looks like a planetary version of the HyperCard Home card



Global Sampler The Earthquest stack navigator is a collection of icons, each of which offers a new way of exploring the earth.

(see "Global Sampler"). It's filled with colorful icons grouped into four broad categories: Earth, Journey, Environment, and World Tour. (Although most of Earthquest is presented in HyperCard's traditional monochrome, several cards are decorated with splashes of color.)

Clicking on the Planet icon reveals a drawing of the Solar System, showing Earth in relation to the planets. In one corner of the Solar System, a spreadsheetlike button hides a pop-up chart full of Solar System data. Clicking on any planet brings up a scrolling text window with a brief description of that planet.

Continue scrolling in that window for descriptions of the other planets. The text window's mini menu includes commands for instantly jumping to the text for any planet, and utilities for finding particular words and printing the text.

The Planet screen is far more than a click-to-read-about-it picture display, however. Like other Earthquest screens, it has all sorts of buttons that cause interesting things to happen. A click on the flying saucer launches an Earthquest "movie"—a short animated sequence created with MacroMind Director. The saucer sequence, like the other Earthquest movies, is likely to disappoint multimedia aficionados expecting a Spielberg epic, but it's the kind of thing that motivates kids to explore every nook and cranny of the program.

It's a Big World

And there's more. A tiny triangle below the title of the Planet card leads to a pop-up menu that links to different global map projections and to screens showing how Earth, the Sun, and the Moon interact to produce tides, seasons, and day and night.

Seven more pop-up menus line the bottom of the Planet card (and most other Earthquest cards). Some of these serve as alternative navigation tools if you don't want to search the screen for hidden buttons; others provide access to different Earthquest treasures. The Quotes menu, for example, is like a small Bartlett's that gives you an eclectic collection of quotations.

(continues)

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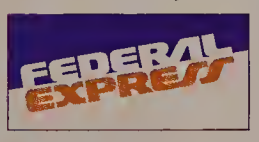

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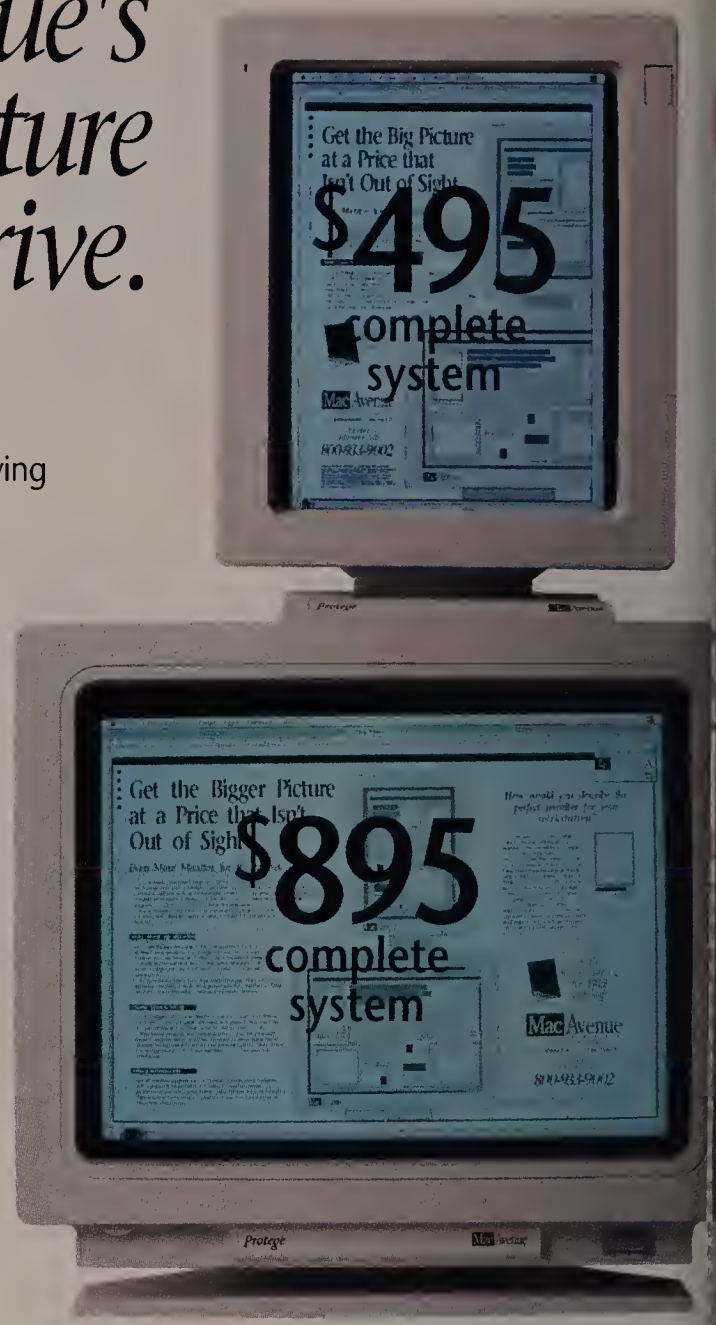

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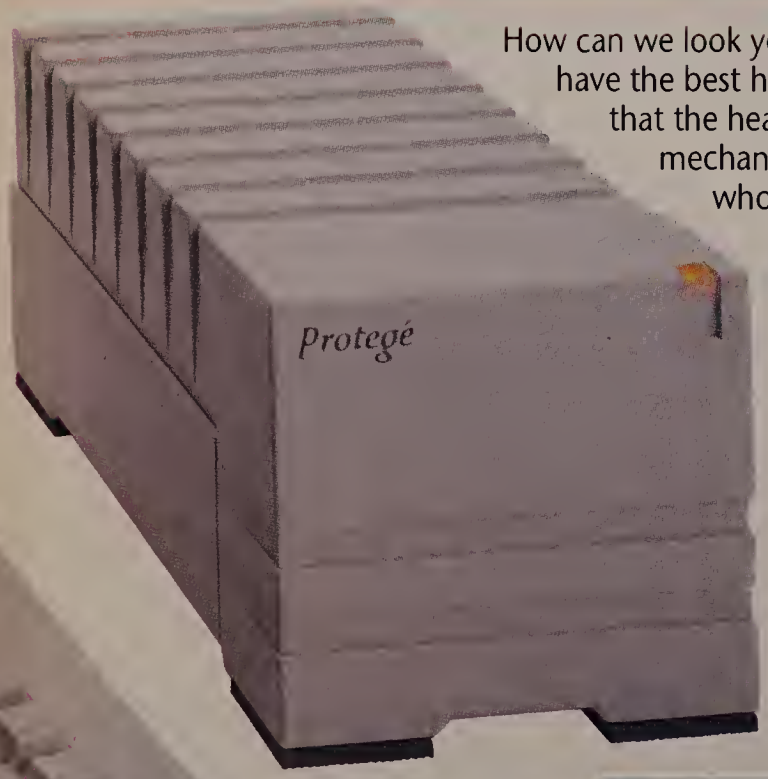

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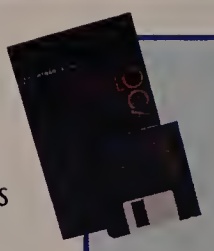

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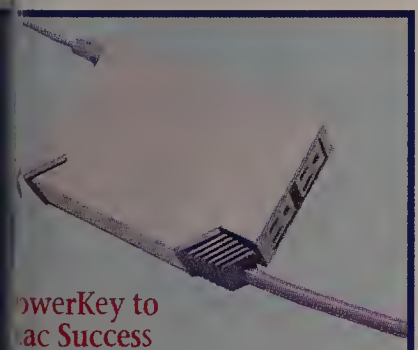

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SilverView 21" w/ SE/30 adapter	22103	$1599

Sunkyang

Full Page Monitor	22010	$349

ACCELERATOR AND EXPANSION BOARDS

DayStar

030 25MHz IIcx w/ co 68882	23640	$1499
030 33MHz IIcx w/ co 68882	23641	$1899
030 40MHz IIcx w/ co 68882	23642	$1999
030 50MHz IIcx w/ co 68882	23643	$2599
50MHz PowerCache IIci	23649	$1995

Technalagy Warks

IIci Cache Card	23648	$269

MEMORY EXPANSION

Applied Engineering

1MB Upgrade for MacRam Portable Card	25488	$359
MacRam Portable Card w/ 1MB	25487	$499

Bay Electranics

1MB TI Laser Memory Upgrade	25489	$159

Interex

Tool kit; 3 pieces	26881	$13.49

Technalagy Warks

2 X 1M8 SIMM Kit 80ns	25480	$104
4 X 1MB SIMM Kit 80ns	25482	$208
4 X 4M8 II/IIx SIMM Kit	25490	$1195
4 X 4MB IIfx SIMM Kit	25491	$1399
4 X 4M8 SIMM Kit 80ns	25481	$1120
Mac Portable 1M8 Upgrade Kit	25485	$389
Mac Portable 3M8 Upgrade Kit	25486	$1195

MacAvenue

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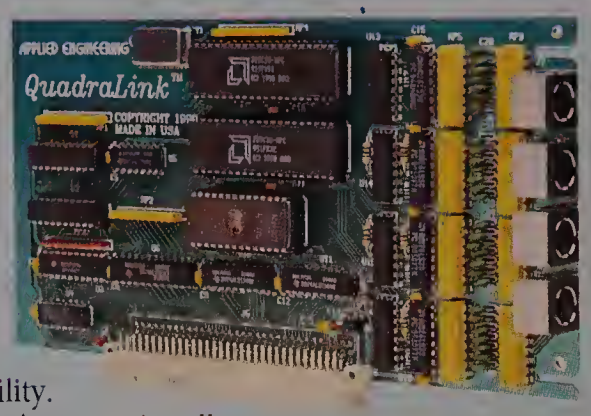
Customer Service is Our Most Important Product

More Serial Ports



Expand your system's expandability. Applied Engineering's easy-to-install **QuadraLink** lets you add four additional serial ports to your Macintosh. Includes a "shadow driver" so that all the new ports will be recognized by virtually all software.

QuadraLink (Applied Engineering). 26917.....$205

KEYBOARDS, MICE, ETC.

Advanced Grovis		
AD8 Mousestick	25286	$66
DataDesk		
Mac 101 Keyboard Platnm (Plus)	25185	$134
Mac-101 Keyboard, AD8	25180	$134
Mac-101 Keyboard Beige (Plus)	25181	$134
SWITCH8ALL	25183	$98
SWITCH8OARD	25182	$159
Kensington		
Turbo Mouse AD8	25281	$107
Turbo Mouse Plus	25280	$107
MacAvenue		
101 Extended Keyboard ADB	25186	$99
MicraSpeed		
MacTrac (SE, II, IIgs)	25285	$75
Mouse Systems		
Little Mouse	25283	$75
Trackball AD8	25284	$69
Seika		
DT3600 Digitizing Tablet	23734	$295

ACCESSORIES

American Power		
UPS 110SE	26292	$207
UPS 370ci	26294	$337
Applied Engineering		
QuadraLink	26917	$205
Bernauilli		
8ernouilli 833C 44M8 Tape Cartridge	57804	$95
Calcomp		
WIZ	26918	$157
Cover-Up		
Diskette Wallet 10pk (alligator)	26909	$7.50
Diskette Wallet 10pk (blue)	26910	$7.50
Diskette Wallet 3pk (alligator)	26911	$5.50
Diskette Wallet 3pk (blue)	26912	$5.50
Mac Plus K8 Skin (81 Key)	25780	$14.95
Mac Plus KB Skin (w/ # Pad)	25781	$14.95
Mac SE/II 101 K8 Skin	25782	$14.95
Mac Plus/SE Dust Cover	26894	$8
Fellowes		
Compact Personal Shredder PS 50	52655	$119
Inlond		
3 Mode Surge Protector	40505	$14.50
InnovativeTechnalagy		
The Library (grey)	26903	$12
The Library (black)	26905	$12
Interex		
9 Pin Male to 9 Pin Male	26298	$7.95
Keyboard Replacement Cable, 3ft	26900	$7
Mac 128/512 to Hayes D89 to 25pin, 6ft.	26281	$7
Mac 128/512 to Imgwrtr D89 to 25pin	26282	$7
Mac to SCSI 25pin M to 50pin M 2ft	26280	$11
Mac to SCSI System Cable, 6ft	26290	$15
MacPlus Peripheral Adapter cable, 1ft	26283	$7
MacPlus, SE, II to Apple Modem	26284	$7
MacPlus, SE, II to Hayes DIN8 to 25pin	26285	$7
MacPlus,SE,II to Imgwrtr DIN8 to 25pin	26286	$7
MacPlus,SE,II to Imgwrtr II DIN8 to DIN8.	26287	$7
Mini DIN-8 to Mini DIN-8 Null	26297	$7.95
SCSI Terminator, 50pin M/F Daisy-Chain	26295	$18
SCSI Terminator, 50pin male	26296	$18
Irwin Magnetics		
External Tape Back-Up 5040/60	23832	$529
External Tape 8ack-Up 5080/120	23833	$719
Kensington		
Apple RG8 Anti-Glare Filter	26891	$62
Mac II Monitor Extended Kit	26899	$32
Mac II Monitor Stand	25580	$62
Mac II Stand and Cable Kit	26892	$63

A Better Network Manager

Technology Works' GraceLAN network management software profiles every device on your network without wearing out your blue suede shoes. Create a comprehensive report of software and hardware configurations, locate any conflicts and even find out which programs are used most often.

GraceLAN (Technology Works). 27750..$375

Kensington (continued)		
Mac II System Stand	26887	$20
Masterpiece Mac II	26893	$103
SE Anti-Glare Filter (beige)	26882	$32
SE Anti-Glare Filter (platinum)	26883	$32
Security Kit	26884	$33
System Saver Plus (beige)	26888	$62
System Saver Plus (platinum)	26907	$62
System Saver SE	26889	$62
Tilt/Swivel Monitor Stand	25582	$24
Universal Printer Stand	26896	$16.95
MacAvenue		
Fuji Rainbow Diskettes-1.44M DS/HD	47496	$15.95
Keyboard drawer	41753	$19
Teak 3.5 Double Rolltop Box (90)	41601	$29
Teak 3.5 Single Diskette 8ox (45)	41600	$17.99
Teak Keyboard Drawer	41752	$69
Poce		
MacAvenue Carrying Case	26898	$65
MacAvenue Carrying Case Extended Kybd	26901	$76
Sony		
3.5 Diskettes 1.44M8 10Pk	57440	$24.95
Sony 3.5 Diskettes 800KB 10Pk.	57401	$13.95
Sophisticoted Circuits		
PowerKey	25030	$64
Tripplite		
Spike8ar SK6-6	40510	$22

SOUND INTERFACES

Articulote Systems		
Voice Navigator II	23736	$649
Forollon Computing		
Hyperdialer	26886	$32
MacRecorder	23730	$158
Passport Designs		
MIDI Interface	23732	$76

Writing and Publishing

WORD PROCESSING, WRITING

Ashton-Tate		
FullWrite Professional v1.5	30601	$253
Claris		
MacWrite II v1.1	30586	$157
Microsoft		
Microsoft Word v4.0	30582	$245
Microsoft Write v1.0	30584	$77
Nalo Press		
WillMaker v4.0	29888	$34
WardPerfect		
WordPerfect Mac v2.0	30591	$234

PAGE LAYOUT PUBLISHING

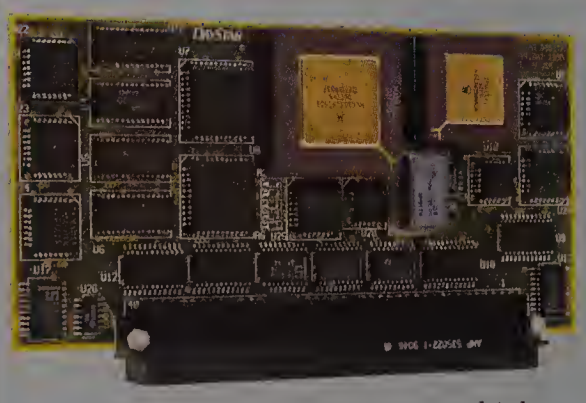
Aldus		
PageMaker v4.0	29781	$497
Cloris		
SmartForm Designer	29200	$291

UTILITIES FOR WRITERS/PUBLISHERS

DeltoPoint		
Taste	30638	$98
Lexpertise		
MacProof v3.2.1	30630	$115
Lifetree		
Correct Grammar v2.0	30633	$49
Reference Softwore		
Grammatik Mac v2.0	30634	$50

FONTS AND FONT UTILITIES

Adobe		
Adobe Plus Pack v1.0	29834	$119
Streamline v1.2	29268	$225
TypeAlign v1.0.4	29826	$58
TypeManager v2.0	29825	$57
Broderbund Softwore		
Typestyler	30450	$115



DayStar Gives You Top Speed

When you're ready for serious high-end performance — 40 Mhz speed — you need DayStar Digital's **PowerCache IIci**. Plug in this turbo-charged cache card and your IIci will be the fastest Mac alive, faster than even the IIfx.

PowerCache 40 MHz IIci with co-processor (DayStar). 23651..$1167

Business Software

INTEGRATED/BUNDLED APPLICATIONS

Microsoft		
Microsoft Works v2.0 w/ Quicken v1.5	30580	$199

ACCOUNTING/BOOKKEEPING

ChipSoft		
Turbo Tax	28500	$51
DAC		
Easy Light Checkbook Acctounting v2.0	28475	$41
Intuit		
Quicken v1.5	28458	$39
Meco		
Managing your Money v3.0	28463	$139
PraPlus		
Wall Sreet Investor	28494	$395
Reolity Softwore		
Wealth8uilder	28496	$145
Softsync		
Accountant Inc. Professional	28481	$345
SaftView		
if x: Personal Tax Analyst	28498	$47
MacInTax 1040 Federal 1990	28502	$61
Softwore Toolworks		
Dollars & Sense v5.0	28465	$86
Timeslips		
Timeslips III v2.0	28504	$196

DATA ANALYSIS AND PRESENTATION

Odesta		
Data Desk v3.0	27818	$458

DATABASE

Acius		
4th Dimension v2.1	27780	$489
File Force	27820	$247
Claris		
FileMaker Pro	27789	$216
Fox Softwore		
Fox8ase + Mac v2.1	27791	$292

Hold a Conference via Macintosh

With Aspects, up to 16 Macs can be connected for a real-time, interactive conference. This *MacUser* Eddy award-winning program lets everyone write text, create graphics or add notes from their own files so everyone in the group will have the information immediately. Saves time and money by linking Macs from across the street or across the country.

Aspects (Group Technologies). 27746 .....$198

Lotus		
Marketplace	29904	$525
Microsoft		
Microsoft File v2.0A	27798	$123
MySaftware		
MyAdvanced MailList	27816	$27
Preferred Pubs		
Database	27834	$67
Sensible Software		
8ookends v1.2	27830	$50
Ventura		
Ventura Publisher v3.0	29906	$582

OFFICE PRODUCTIVITY PROGRAMS

Microsaft		
Microsoft Mail v2.0	30496	$85
Power Up		
Letter Writer Plus v1.0	30440	$54

SPREADSHEET PROGRAMS/TEMPLATES

Informix		
Wingz v1.1	30184	$245
Microsoft		
Microsoft Excel v2.2	30180	$245

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Tax Help From MacInTax

Four-time World Class and Eddy award winner! MacInTax is the best-selling tax product for the Macintosh. Loaded with new features for 1990! And MacInTax is the only tax product available that prints exact replicas of IRS forms and schedules on blank paper. Full integration with 13 optional state supplements.

MacInTax (SoftView). 28502 ..... $59

TIME AND PROJECT SCHEDULING

Claris
- MacProject II v1.21 ..... 29740 $366

Communications

ON THE MODEM

Farallon Computing
- Timbuktu/Remote v2.0 ..... 27669 $123

Hayes
- SmartCom II v3.2 ..... 27663 $84

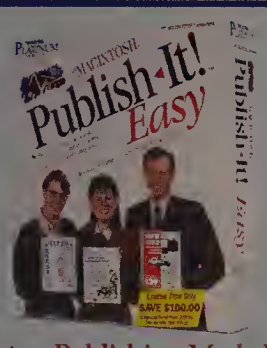
Microcom
- Carbon Copy Mac v1.04 ..... 27708 $119

Microsoft
- MS Mail 20 Pack v2.0 ..... 27680 $959
- MS Mail Workstation 27676 $83

Prodigy Services
- Prodigy Startup Kit 27726 $27

Solutions Inc.
- Faxgate Plus 27712 $237

SW Ventures
- Microphone II v3.0 ..... 27660 $213



Desktop Publishing Made Easy

Publish It! Easy 2.0 from Timeworks gives you high-end desktop publishing features at a low-end price. Word processing, graphics and page-layout features work on any Mac — **Publish It! Easy** doesn't require a hard drive. a *MacUser* Eddy award winner.

Publish It! Easy 2.0 (Timeworks). 29896....$145

Tops
- NetPrint v. 2.0 ..... 27686 $115
- Tops Network Bundle/DOS 27685 $159
- Tops Network Bundle/Mac 27682 $188

Traveling SW
- LapLink Connectivity 27710 $119

ON THE NETWORK

Dataviz
- MacLink Plus 27718 $118

Farallon Computing
- Timbuktu v3.1 ..... 27667 $95

Insignia Solutions
- Soft PC AT w/ EGA Add-on Module 27716 $355
- Soft PC v1.3 ..... 27714 $245

Education and Entertainment

ON THE LEARNING CURVE

A Lasting Impression
- ResumExpert 28016 $38

Broderbund Software
- Calculus v1.2 ..... 27964 $57
- Geometry v1.2 ..... 27962 $57
- Physics v1.2 ..... 27966 $57
- Type! v1.0 ..... 27958 $18

Carina Software
- Voyager v1.2 ..... 28004 $87

Davidson & Assoc.
- AlgeBlaster Plus 28042 $37
- Math Blaster Mystery 27970 $27
- Math Blaster! v1.0 ..... 27968 $29

Goldstein & Blair
- Mac Bible, 3rd edition 28026 $22
- Mac Bible (Super) 28028 $28

Great Wave
- KidsMath v1.1 ..... 27990 $25

Individual SW
- Training for Pagemaker 28030 $38

MECC
- Exploring Microsoft Works 28032 $17
- Number Munchers 28034 $29
- Word Munchers 28036 $29

Sensible Software
- Sensible Grammar v1.6.2 ..... 28010 $50

Simon & Schuster
- Typing Tutor 28008 $28

Visionary Software
- Synchronicity v2.5 ..... 28040 $39

JUST FOR THE FUN OF IT

Accolade
- Mean 18 ..... 28690 $25
- Stratego 28772 $31

Activision
- Cosmic Osmo 28700 $40
- Manhole 28696 $28
- Manhole (CD ROM) 28698 $34

Bob LeVitus
- Stupid Mac Tricks 28750 $16

Broderbund Software
- Playroom 28770 $32
- SimCity Supreme (Mac II) 28680 $47
- SimCity v1.2 ..... 28678 $28
- Carmen San Diego Europe 28674 $29
- Carmen San Diego USA 28676 $29
- Carmen San Diego World 28672 $29
- Carmen San Diego Time 28774 $29

Bullseye
- Fokker Tri-plane v2.02 ..... 28682 $25

Casady and Greene
- Mission Starlight 287S2 $29
- Sky Shadow 287S4 $29

Centron
- Casino Master 28758 $38
- Casino Master Deluxe 28760 $43

Electronic Arts
- Bards Tale 286S4 $30
- Chuck Yeager Flight Simulator 286S6 $30
- Earl Weaver Baseball 28768 $32

In-Line Design
- Bomber v2.0 ..... 28739 $30

Sierra-On Line
- Kings Quest 1 ..... 28724 $28
- Kings Quest 2 ..... 28726 $28
- Kings Quest 3 ..... 28728 $28

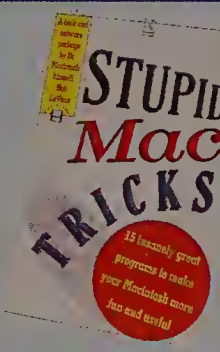
Software Toolworks
- Life & Death 28658 $31

Spectrum Holobyte
- Faces 28766 $24
- Falcon v2.2 ..... 28614 $30
- Tetris 28606 $20
- Welltris 28604 $19

Strategic Studies
- Reach for the Stars 28652 $25

SW Toolworks
- Chessmaster 2100 ..... 28748 $31

XOR
- MacGolf 28708 $33
- MacGolf Classic 28628 $51
- MacSki v1.0 ..... 28756 $38
- NFL Challenge v1.2 ..... 28630 $54



New Tricks for Your Mac

The Macintosh is fun to use, but a few **Stupid Mac Tricks** will make it even better. Use this book and the free disk to teach your Mac to make strange sounds and perform off-beat antics.

Stupid Mac Tricks (Addison-Wesley). 28750 ..... $16

Create Professional Animation

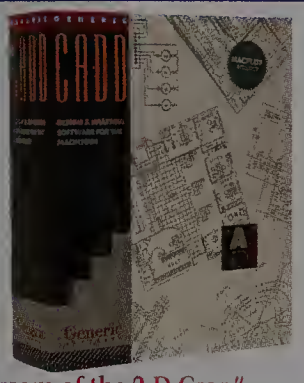
FilmMaker from Paracomp gives you professional-quality animation with features such as real-time control over position, scale and rotation of animated objects, as well as full-screen anti-aliasing. And with the help of **FilmMaker**, your presentations also will take on new power.

FilmMaker (Paracomp). 29900 ..... $437

The Graphic Arts

MOSTLY DRAWING/PAINTING

Adobe
- Illustrator v3.0 ..... 29789 $348
- Photoshop v1.0.7 ..... 29266 $498



"Cream of the 2-D Crop"- Infoworld

Generic CADD from Generic Software gives you powerful computer-aided design features and sophisticated tools — all the tricks of the trade — at a price that's only a shadow of other CAD package prices.

Generic CADD (Generic SW). 29280....$372

Aldus
- FreeHand v2.02 ..... 29784 $326

Baseline
- Color MacCHEESE v1.05 ..... 29310 $55

Claris
- Claris CAD v2.0 ..... 29207 $639
- MacDraw II v1.1 ..... 29204 $291
- MacDraw Professional 29205 $291
- Claris MacPaint v2.0 ..... 29202 $94

Generic Software
- Generic CADD 29280 $372

Paracomp
- Swivel 3D Professional v1.0 ..... 29294 $427

GRAPHIC ART COLLECTIONS

Multi-Ad Services
- ProArt Holidays 29876 $95
- ProArt Sports 29878 $95

Paracomp
- Swivel Art v1.0 ..... 29308 $82

MOSTLY GRAPHICS EDITING

Paracomp
- FilmMaker 29900 $437

PRESENTATION MANAGERS

Symantec
- More v3.0 ..... 30605 $265

CERTIFICATE AND AWARD GENERATORS

Broderbund Software
- Print Shop v1.31 ..... 29836 $35

GRAPHICS UTILITIES

Frame Technology
- FrameMaker Mac 29864 $745

DO IT YOURSELF PROGRAMMING

MicroSoft
- QuickBasic v1.0 ..... 27590 $64

Spinnaker
- PLUS v2.0 ..... 27826 $279

Symantec
- Just Enough Pascal v1.0 ..... 27582 $48
- THINK C v4.0 ..... 27586 $163
- THINK Pascal v3.0 ..... 27584 $160

OPTICAL CHARACTER RECOGNITION

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- Recognize! 30640 $479

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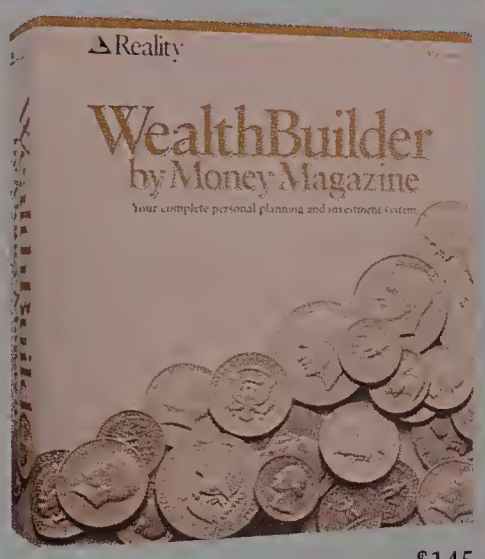
Build Your Wealth



WealthBuilder by *Money* magazine will guide you through the stormy waters of financial planning and give you advice on investing, saving and strategic planning. You just ask questions, **WealthBuilder** has all the answers.

WealthBuilder v1.0 by *Money* magazine (Reality Software). 28496.....$145

HP Printing Utility

MacPrint lets you print from any Mac application to the Hewlett-Packard LaserJet and DeskJet series printers as well as the Epson EPL 6000. Convenient Chooser-level driver selection provides straight forward Mac printing.

MacPrint v1.2 (Insight). 30428.....$94

Safety, Maintenance and Repair Utilities

DATA ORGANIZATION

On Technologies		
OnLocation v1.0	30434	$75

DATA STORAGE, MANAGEMENT/REPAIR

Boseline		
APB Express v1.0	30544	$55
Central Point		
Mac Tools Deluxe v1.01	30365	$79
Microcom		
911 Utilities	30550	$92
Complete Undelete v1.0	30420	$48
Solient		
Disk Doubler v3.0	30546	$47
Symantec		
Norton Utilities for the Mac v1.0	30436	$79
Sum II v2.0	30340	$98

SHORTCUT AND TIME SAVING UTILITIES

Individual SW		
101 Scripts & Buttons	30426	$35
Software Innovations		
HandOff II	30510	$51

SCREEN SAVER UTILITIES

Berkley Systems		
After Dark v2.0	30425	$24
Fifth Generation		
Pyro v4.0	30399	$25
Ibis Software		
Protector Shark	30538	$31

VIRUS DETECTORS AND ERADICATORS

Microcom		
Virex v2.7	30413	$53
Symantec		
SAM v2.0	30342	$63

OTHER UTILITIES

Abbott Systems		
CanOpener v1.1	30348	$63
Baseline		
Talking Moose v3.0	28762	$23
Broderbund		
SimEarth	28764	$45
CE Software		
QuicKeys v2.0	30357	$94
Custom Applications		
Freedom of Press Light v3.0	30554	$58
Freedom of Press v3.0	30444	$255
Fifth Generotion		
Suitcase II v1.2.3	30402	$47
GDT		
ParaLink Express	30548	$99
Insight Development		
MacPrint v1.2	30428	$94
Now Software		
Now Utilities v2.0	30498	$75
Power Up		
Calendar Creator v1.0	30432	$41
Letter Writer Plus/Address Book Plus v1.0	29404	$85

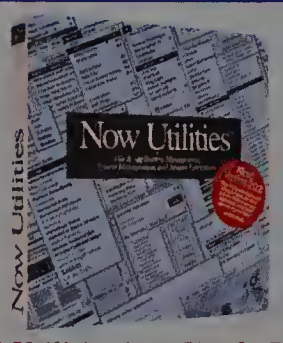
CD-ROM Software

ON THE LEARNING CURVE

Wayzata		
US Civics	28012	$79
World Factbook 1989	28014	$79

GRAPHIC ART COLLECTIONS

NEC		
Clip Art 3D	29880	$241
Image Folio	29882	$244
Photo Gallery	29884	$244
Type Gallery	29886	$244
Wayzata		
US Seals	29304	$55
Recognize!	30640	$479



12 Utilities in a Single Box

Cut corners and streamline your Mac operations with **Now Utilities** from Now Software. For starters, you can customize your Finder, rename your Inits or add a pop-up menu of most-used folders. Use a few of these handy utilities and you'll wonder how you got by without them.

Now Utilities (Now Software). 30498.....$75

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Every hardware product and every office accessory MacAvenue sells will give complete satisfaction. If not, return it in the original packaging within 30 days of purchase for a full refund. Consumable items, opened software, videotapes and shipping costs are not refundable.

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Everything at MacAvenue is designed to give you the affordable, reliable Macintosh products you want *when you want them.*

Orders placed by 8:00 pm, CST, weekdays for in-stock items ship the same day (barring system failure) with a $2 overnight delivery charge.

For your convenience, we accept VISA, MasterCard, Discover or American Express — no surcharge will be added.

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With all of the links between cards in Earthquest, it's easy to lose your way. The upper-right-hand corner of almost every screen contains a navigation control center for returning to the previous card or to the main menu. There's enough variety to keep kids (or adults) busy for hours—watching animated simulations of the ecological consequences of overpopulation; clicking on dynamic maps that show the geological phenomena and geographical boundaries of the planet; hearing snippets of other languages while reading about cultural diversity; learning about concrete actions we can all take to preserve the planet; and playing test-your-knowledge multiple-choice games. (As a bonus, the package includes a copy of the outstanding Global Warming stack created by Apple employees and given to Soviet President Gorbachev last year.)

It's a Small World

In the sense that Earthquest promises the world, it sets itself up for failure. Packing all of human knowledge onto a handful of floppy disks is bound to result in some agonizing compromises. Musical morsels are unforgivably short; movies are simplistic; "simulations" are little more than animated snippets; explanations are often missing or superficial; places that look as if they should be buttons don't do anything. (Why on earth is the Bermuda Triangle the only button on the continental United States map?)

Earthquest is too big for many Macs. I had trouble installing it on a Mac Plus, and even after it was installed, I found that some of the features didn't operate properly. The company strongly recommends 2MB of RAM; I'd say it's a necessity. In short, Earthquest should be on a CD ROM where it wouldn't be subject to disk space limitations.

I found that, even on a beefed up Mac IIci, Earthquest occasionally froze the system, forcing me to restart.

Down to Earth

Earthquest is available in lab packs for classrooms at substantial savings ($350 for a 10-station site license and teacher-support materials). The program has tremendous potential as an enrichment tool for middle- and high-school science and social studies classes. Students can use it for independent exploration and study; teachers can use it as a basis for class projects. Students and teachers can export maps and pictures to a Workshop, modify the artwork with HyperCard's paint tools, and print it. (Unfortunately, there's no option for exporting text via the Clipboard.)

Many educational tools are designed to help students understand the details of a discipline; few help them to see the big picture. It's hard to imagine how anyone could spend time exploring this stack and not come away with a deeper understanding of the home planet.—**George Beekman**

See **Where to Buy** *or circle 624 on reader service card.*

Financial Planner

WEALTHBUILDER BY MONEY MAGAZINE 1.0

Pros: Suggests investments based on your investment philosophy; attractive reports; videotape introduces financial planning concepts; excellent context-sensitive help system and online financial tutorial; handy financial calculators. **Cons:** Stock, bond, and mutual fund databases contain only 500 entries each; confusing interface. **Company:** Reality Technologies. **Requires:** Mac Plus; hard drive with 6MB free disk space; System 6.0. **List price:** $249.95.

The essence of my financial plan has always been to make as much money as possible, save whatever I can without changing my life-style, and live and retire comfortably. My investment strategy follows similar lines. Pick a few stocks or mutual funds at random, and see what happens. Then I watch the stocks drop to 50 percent of their purchase value, hold them for 5 to 15 years in the hope that they'll come back, and sell them all the day before the start of the next great bull market. By comparison, Las Vegas is starting to look good. (At least I know the odds.)

The purpose of WealthBuilder by Money Magazine is to help you formalize the financial planning process and come up with real, measurable objectives. The program forces you to set goals for budgeting, saving, and investing. It includes a database of stocks, bonds, and mutual funds that you can sort, filter, and compare in order to select your ideal investments. Over time, the program tracks your progress and suggests steps you can take to help achieve your goals.

Setting Up

Before you can plan for the future, WealthBuilder needs to know how you're doing today. You enter basic information about yourself and your dependents, set up a monthly budget with typical expenses and income, and provide figures necessary to calculate your net worth. You must also specify an investment philosophy—somewhere between Very Conservative and Very Aggressive. WealthBuilder uses all this information to suggest an appropriate mix of investments.

Most people won't stop with calculating their net worth. That's not where WealthBuilder's power lies. The next step is to formulate some goals (Objectives), such as retirement or financing a child's college education. To set an objective, you fill out a simple worksheet. In the case of retirement, indicate how much money you'll need per year of retirement (in today's dollars) and which of your current assets should be earmarked for that purpose. There are several key assumptions that affect the program's projections, such as your age at retirement and life expectancy, the inflation rate, and whether you want to preserve or deplete your principal during retirement. Once you complete the worksheet, you can instantly see the likelihood of meeting your goal. The program's Timeline window shows what should happen if nothing in your financial situation changes (see "Timeline Window"). Objectives directly supported by the program are college education, buying a house, and retirement. There's also an option to set special goals, such as buying a new car.

Building a Portfolio

Clicking on the Allocate icon lets you compare the makeup of your current

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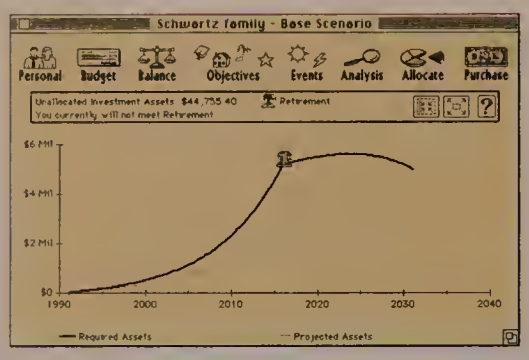

Timeline Window Icons in the Timeline window let you move into any major segment of the program. The graphic time line shows instantly the likelihood of attaining any specific financial objective.

portfolio with one suggested by the program. Based on your Investment Philosophy setting, the program tells you what percentage of equities, bonds, metals, and cash your portfolio should contain. You can also request a detailed suggested allocation and get a further breakdown of the types and dollar amounts of bonds, stocks, and mutual funds you should buy.

Assuming you're ready to make some investments, you can check WealthBuilder's Product list—detailed information on 500 stocks, 500 bonds, and 500 mutual funds. You can filter the list by showing only the ones judged most likely to produce maximum capital gains or long-term growth, and then select only the industries and sectors you're interested in. You can sort the information by a number of criteria, such as current price, beta, S&P ranking, or P/E ratio. As you identify investment vehicles of interest, you can perform additional analyses, producing comparative graphs of annualized, cumulative, or start-adjusted returns. You can also see how each of your picks has performed historically compared to key indicators such as the New York Stock Exchange, T-bills, and gold. Although WealthBuilder won't suggest specific stocks, bonds, or funds, it provides you with most of the information you need to make your own choices.

Problems

For the most part, WealthBuilder looks and acts like a HyperCard stack. The Timeline window serves as the main menu, enabling you to get to most of the components by clicking on icons. The HyperCard analogy isn't carried far enough, though. The icons won't take you everywhere. Some actions can be initiated from the Timeline window, some only from menus, and some from both places. Some items on the different WealthBuilder "cards" respond to clicks, and others are only highlighted by this action. Several dialog boxes have no Cancel option. If, for example, you click on the Special Objective icon just to see what it does, you have to choose the Delete Objective menu item to get rid of it. As with most programs, you adjust with experience, but the interface needs work.

WealthBuilder's database of mutual funds, bonds, and stocks might make you feel like you're missing something. Of the four mutual funds I hold shares in, only one is listed. For a larger set, you have to subscribe to one of the database update programs. In fact, if you're serious about investing, you should consider the updates a *must* buy.

Updates to the mutual fund and stock/bond databases are available on a subscription basis for $99.95 each (plus shipping and handling) or $174.95 for both. The updates expand the databases to include information on 1200 mutual funds, 4600 stocks, and 6100 bonds. A $9.95 demo of WealthBuilder is also available and includes a copy of Money Magazine's Guide to Financial Planning and a $10 rebate coupon for WealthBuilder.

Finally, although WealthBuilder produces a variety of beautifully formatted reports, you'll find that report printing doesn't work if Radius's Math INIT is present. If you generate a report with background printing switched on, the spool file continues to build in size until your entire hard drive is filled.

Most people I know are unsophisticated investors. Not only will WealthBuilder educate you in investment basics, it'll also suggest an appropriate mix of investments and track the progress made toward your financial goals. Of the product's shortcomings, all except the interface design can easily be remedied—just pull the INIT and buy the updates. If you've been looking for a financial program that can do more than just record investment transactions, WealthBuilder fits the bill. It's the financial program I've been waiting for.—**Steven Schwartz**

See **Where to Buy** *or circle 715 on reader service card.*

Professional Flight Simulator

ELITE PROFESSIONAL FLIGHT SIMULATOR 1.0

Pros: Realistic flight-instrument depiction; real-life navigation database; keyboardless user interface; accurate aircraft flight dynamics. **Cons:** Can't save state of simulation; can't print flight-path display. **Company:** AzureSoft. **Requires:** Mac II; 2MB of RAM; math coprocessor; 8-bit color display. **List price:** $749.

Flight simulators in the past were primarily entertainment. AzureSoft's ELITE (Electronic IFR Training Environment) is the first Macintosh flight simulator developed exclusively for flight training. A licensed instrument-rated pilot can use ELITE to satisfy most of the Federal Aviation Administration's (FAA) six-month recurrency training requirements, and a private pilot looking to obtain an instrument rating may soon be able to satisfy half of the required flight hours with ELITE-based simulator training.

Not a Toy

AzureSoft—a subsidiary of Azure Technology, maker of aircraft navigation equipment—expects only serious pilots to use ELITE. The basic package simulates a simple IFR-equipped (Instrument Flight Rules) single-engine airplane, and includes software, a thin manual, and a Universal Controls Interface box that connects the Mac to separately purchased flight controls. The minimum Mac configuration requires a II-class CPU with a math coprocessor, 2MB of RAM, and an 8-bit color display. It runs best on a Mac IIci or faster machine.

The flight controls—a yoke and optional rudder pedals—are needed to really fly the simulator. Without them (and the attendant interface box) ELITE lapses into a three-minute demo mode during which you can experiment with the controls and do some limited flying. You can use either the Maxx Yoke control wheel ($99.95) or the more sensitive (and easier to use) FlightStick from CH Products ($79.95).

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The optional Maxx Rudders give you rudder pedals, which might be useful for initial instrument training but which aren't really necessary if you're already an instrument-rated pilot.

Also available is a $99 ELITE/SEL high-performance aircraft add-on, which simulates a "complex" single-engine aircraft with retractable landing gear and more-sophisticated navigation equipment. AzureSoft also offers a $699 ELITE/Jet add-on, which simulates a DC-9 model MD-80 airliner, complete with radar altimeter, machmeter, turbine-engine instruments, and a fully programmable navigation system.

The basic package includes a navigation database for the San Francisco Bay Area, covering about 30 airports. You can purchase additional databases for any metropolitan area in the United States for $50 each.

If you already know how to fly airplanes and understand IFR navigation, the skimpy manual is perfectly adequate. The manual briefly describes the ELITE setup, some basic operating procedures, the instrument panel, and the moving map display. It doesn't explain how to take off, navigate, find the destination airport, or land.

Virtual Reality

ELITE is easy to operate, however, even if you're completely unfamiliar with the Mac. This is in part due to ELITE's stunning color instrument-panel presentation (see "The Captain's View"), but it's mostly the result of AzureSoft's decision to exclude any keyboard controls. You operate ELITE's cockpit the way you operate controls in a real aircraft: by reaching out and touching them (with a pointing-finger cursor). The instrument panel depicts all equipment with the same layout found in real aircraft, and with astonishing visual detail. Controls are three-dimensional and tactile. Buttons push, sliders slide, knurled wheels wheel. Annunciator and warning lamps illuminate with the same colors found in a genuine cockpit, and instrument faces show the same markings as the real instruments. Even the navigation radios provide audio morse-code identification on demand.

These are not Macintosh controls but real-life controls. For example, if you slide off a button after pushing it and holding the pointing finger on it, the button activates, just as in real life. Similarly, pulling the landing-gear handle partway down leaves the handle in the partial position—the switch isn't snapped to a fully on or off position like Mac toggle switches.

This attention to detail makes ELITE immediately flyable by any pilot. With the control stick in your left hand and the mouse in your right, operating ELITE is natural and comfortable. You quickly forget you're flying a simulator and begin concentrating on the instrument panel and the view out the window.

The objective of IFR flying is to control the aircraft and navigate without reference to outside visual cues such as the horizon. With ELITE—just as in real instrument flying—you see two things outside: the runway when you take off and the runway again when you land. Shortly after takeoff you fly into the cloud ceiling and the windshield view goes gray, then hazy, then milky white. On final approach, you slowly descend out of the soup (at the preset cloud-ceiling altitude) with a realistically foggy, mist-shrouded view of the runway that gradually clears as you get closer. ELITE lets you practice your approach-transition technique, including an option to set a variable cloud ceiling that could force you to execute a "missed approach" procedure—another critical IFR training regimen.

The runway in the windshield on final approach is an authentic depiction of the actual destination airport's runway—right down to the runway length and type of approach-lighting system. Even the Visual Approach Slope Indicator (VASI) lights—red and white lights on the side of the runway that indicate your approach angle—indicate the FAA-published approach angle. ELITE uses actual FAA navigation data for the airport latitude and longitude, runway configurations, navigation beacon frequencies, geography, airways, and intersections. This means you can navigate in ELITE airspace using standard-issue government maps and approach charts.

The Captain's View This view of the final approach to San Jose International (SJC) runway 30L is exactly what you'd see in a real aircraft making an actual instrument approach into SJC, right down to the radio frequencies, runway heading, and approach-lighting configuration.

No Airplane Does This

ELITE provides a moving map display that shows your current position, ground track, and (optionally) vertical flight profile. This display provides valuable feedback on your piloting technique, letting you see how closely your flying complies with FAA position and altitude rules. In addition, you can drag the aircraft's icon on the map display to any geographic location in the database and preset your altitude, heading, and airspeed—a feature that simplifies the repetitive practice of a troublesome approach procedure.

ELITE supplies an Environment control panel, from which you can set the turbulence level (from none to severe), wind speed and direction, cloud ceiling, visibility, and barometric pressure—all parameters that directly affect instrument flying. AzureSoft's attention to detail shows here, too: turbulence causes gauges to jiggle; wind direction and speed gradually change from the surface to your flight altitude; the cloud-ceiling altitude varies randomly; barometric pressure affects the accuracy of the altimeter if you forget to make a compensating setting on the altimeter itself. The Environment panel also lets you tag instruments for imminent failure—at some random future time. When an instrument fails, it behaves just as it would in a genuine failure—giving somewhat inaccurate readings before going dead as a doornail.

Kudos and Caveats

ELITE's best features are its excellent navigation database, high-quality cockpit imagery, and keyboardless direct-action interface. If anything, ELITE

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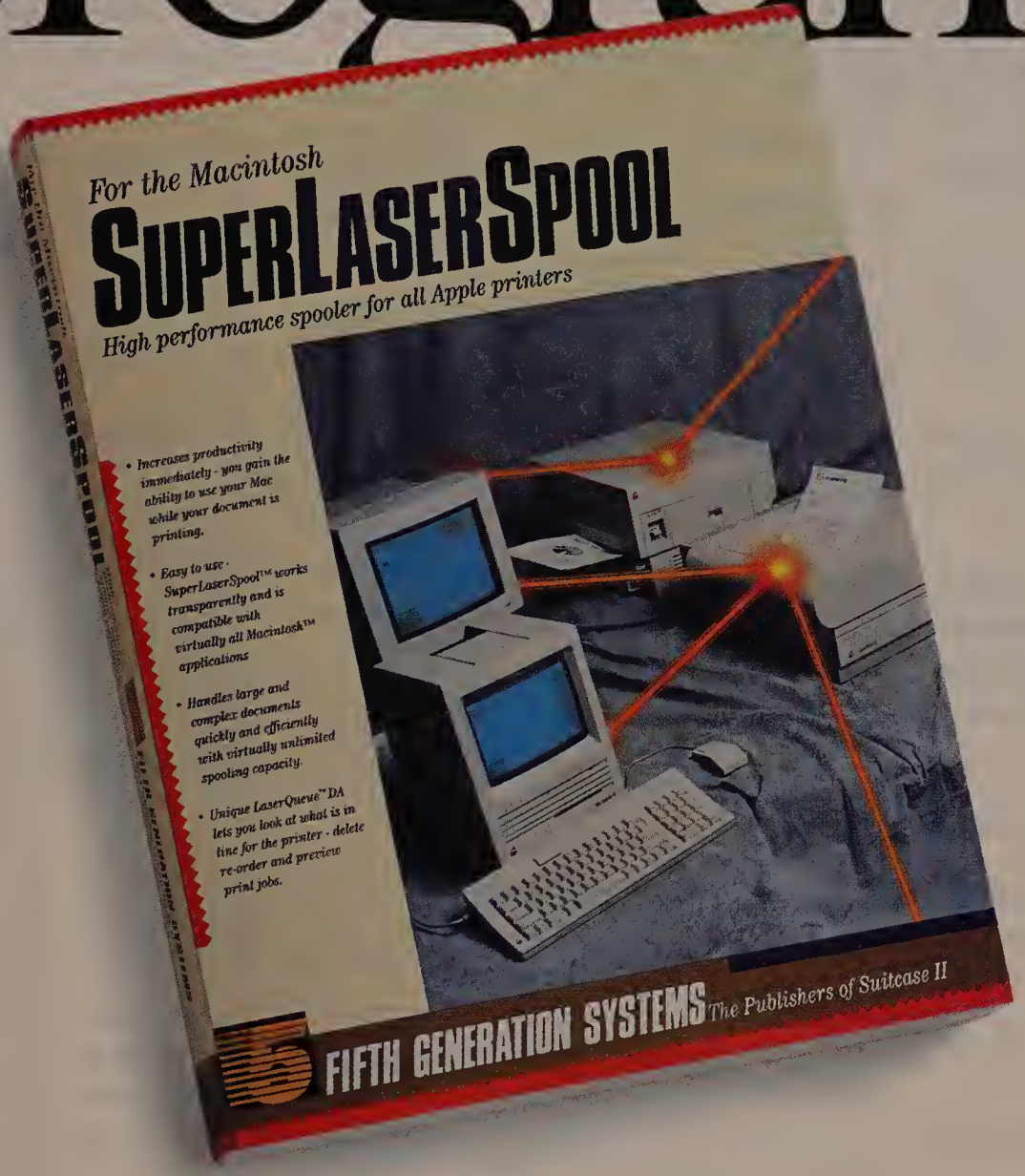
Wait loss program.



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Symbol Bold Italic
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THOR
Thunderbird $25
THUNDER
ITC Tiepolo $150
ITC Tiffany $200
ITC Toms Roman $25
Tom's Roman
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TOO MUCH OPAQ
TOO MUCH SMAS
Ultra Condensed (IC) $50
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Ultra Condensed Serif
Uniform Regular (IC) $200
Uniform 45 Light
Uniform 46 Light
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is harder to fly than the aircraft it simulates, thus ensuring a good workout for any pilot. During my extensive testing—including actual recurrency training logged as legal flight time—I encountered only one bug (a mountain where it shouldn't have been); AzureSoft says the bug will be fixed by the time you read this.

However, ELITE's minimalist manual may be its weak point. And the moving map display—perfect for training—lacks a provision for making a permanent printed record. A printout would be invaluable for student/instructor review, and although I did get a printable screen snapshot using the shareware utility Flash-It (version 1.3, by Nobukazu Toge), that's hardly a convenient procedure.

I also found myself wanting to save the state of the simulation. ELITE has a pause button that lets you temporarily suspend flight, but you can't quit the simulation and then resume where you left off. Neither can you call up a preset position—say, the final approach into San Jose International runway 12R. If you want to repeatedly practice an approach, you must set it up manually each time. Finally, while ELITE runs under MultiFinder, you can't leave ELITE without quitting the application because ELITE takes over the entire Mac interface, including menu bars and the keyboard. This isn't a serious problem, but AzureSoft should document the limitation.

As an instrument-rated pilot constantly struggling to keep up with the FAA's six-month recurrent training requirements, I found ELITE competed favorably with the $30,000 analog simulators typically used for IFR training today. Such simulators rent for $20 to $50 per hour. If you train in a real aircraft (at a cost of $70 or more per hour) you'd recover your $749 investment in ELITE in less than two years.

According to AzureSoft, ELITE may soon qualify as the first personal computer–based primary-instrument flight trainer, making it eligible for initial instrument training as well as recurrency training. ELITE, which also runs on 386-based IBM PCs and compatibles, truly opens the door to low-cost, PC-based instrument flight training.—**Mel Beckman**

See **Where to Buy** *or circle 626 on reader service card.*

Portable Hard Drives

LA CIE TSUNAMI 80-Q

Pros: Small; portable; value-added software included. **Cons:** Limited manual; SCSI screws come loose. **Company:** La Cie, a Plus Development company. **Requires:** Mac Plus. **List price:** $799.

LIBERTY 80

Pros: Small; portable; no fan needed. **Cons:** Uses larger connector than SCSI; troublesome daisy-chaining; very limited manual. **Company:** Liberty Systems. **Requires:** Mac Plus. **List price:** $899.

MARK JOHANN

La Cie Tsunami 80-Q, Liberty 80

Liberty Systems and La Cie are vying for the lightweight championship of hard drives.

Liberty Systems points out that its drive is smaller than the Tsunami, and that's true. Both weigh in at 80MB, but the La Cie measures 8 by 6 by 2 inches while the Liberty 80 measures 7 by 5 by 2. The Tsunami 80-Q and the Liberty 80 are both easily transportable. The Liberty 80 fits into a briefcase easily and squarely. The Tsunami 80-Q is somewhat harder to pack in such a small space because of the ridges on the side and the cylindrical vent on the front. If you don't need to transport the drive a lot, however, the size difference shouldn't matter. The heads autopark when you turn off the units, and the drives perform well when you hook them up again.

BENCHMARKS

	Tsunami	Liberty
Seek Time	22 ms	22 ms
Read Average	5329	5096
Write Average	4379	4155

Seek time is the time taken to move the head of a hard drive from one track to another (averaged over 10,000 seeks). The average includes the time it takes to move the head after receiving the seek command from the CPU and the time it takes for the head to settle on the data on the destination track.

Read and write averages (represented here in kilobits per second) are the average rates of transferring different-sized blocks of data from the hard drive to the CPU (read) and from the CPU to the hard drive (write).

All benchmarks were performed using SCSI Evaluator, a shareware utility by Digital Microware.

Both units have mechanisms built by Quantum, so there is little performance difference. In tests conducted using the SCSI Evaluator program, both drives had an average seek time of 22 milliseconds. Liberty claims access times of 12ms to 19ms while La Cie refers only to "access times as fast as 15ms" for its entire line of drives, from 20MB to 210MB.

The Liberty unit has the company's phone number prominently displayed on the FCC sticker—a great idea. If you have a problem with the drive, you don't have to go fishing through mounds of owner's manuals.

One definite advantage of the Tsunami is that it comes packed with value-added software including Symantec Utilities for Macintosh; The Norton Utilities for the Macintosh (also from Symantec); La Cie utilities; a Wingz test-flight (demo) from Informix; and a whole array of shareware and public domain programs, games, and utilities.

I had trouble daisy-chaining the Liberty drives. This was partially due to the fact that the Liberty 80 has industry-standard Centronics jacks (so it can be used on a wider variety of computer platforms); the Tsunami 80-Q has the Apple SCSI jacks (the Liberty 170MB and larger drives all have SCSI connectors). I also had a problem when I removed the SCSI cable to switch drives—a piece of the hard drive fell out. It wasn't too serious, only the socket for the screw that

(continues)

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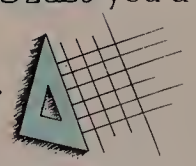
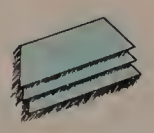
We know advertisements don't sell MacDraft®...our customers do. 70% of the people who purchased MacDraft bought it because it was recommended by a friend or coworker. That says a lot about a product.

So what do you think they recommend it for? Well, with a name like MacDraft you'd expect it to be ideally suited for drafting.  But, did you know that over a quarter of our customers use MacDraft for technical illustration? And almost a third use it to create graphics for desktop publishing and presentations.

Of course our customers recommend MacDraft. They helped to design it. They told us they wanted a complete set of powerful drawing tools to create and edit objects. Features like Bezier and spline curves and the ability to apply their own custom line styles to each of these shapes. (Well, we took care of that.) Our customers also felt it was important to have control over their drawing environment. They wanted to create scaled drawings and organize them using layers,  zoom in to create fine detail or zoom out to see their entire drawing. Then they wanted to store their commonly used graphic elements in symbol libraries for use in other drawings. (We took care of that, too.)

MacDraft customers are creative people. They want to present meaningful information in an exciting way. So we've given them control over the font, size and style of each character in a text block and rotation in less than one degree. We've even given them the ability to read, crop, and resize TIFF files and 24-bit color images. All this, plus the full 16.8 million colors of the Macintosh® and PostScript® printing to add pizzazz to their presentations!

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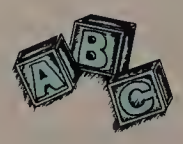
Sure our customers wanted all these powerful features, but they said we must keep MacDraft simple and easy to use.  (And that's always been our philosophy.)

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Circle 380 on reader service card

tightens the SCSI cable, but it was a surprise. I screwed it back in as tightly as I could, but it kept coming loose.

Some people complain about technical support from La Cie, but I had no difficulty—once I actually got to talk to someone. I called the company and was told all the tech support people were busy and that someone would get back to me. Several hours later, a very helpful tech support person called.

Liberty's technical support is somewhat faster than La Cie's. When I called, I was instantly in touch with a tech support person, who worked with me to solve my problem.

Overall, the Liberty 80 and the Tsunami 80-Q drives are excellent investments. Their small size makes them very transportable—you can carry them over your shoulder like a Walkman or slip them easily into luggage—and their speeds won't make you wait for data. With their small size and big volume, it would be hard to beat these drives.—**Shawn Tomlinson**

See Where to Buy or circle 658 (La Cie Tsunami 80-Q), 662 (Liberty 80) on reader service card.

Apple File Exchange Translators

SOFTWARE BRIDGE MACINTOSH 1.0

Pros: Transfers and translates files in one step. **Cons:** Supports only current versions of word processors; doesn't support Microsoft Word's Fast Save format. **Company:** Systems Compatibility Corporation. **Requires:** Mac 512K; hard drive; Apple File Exchange; Super-Drive, or other means of transferring files. **List price:** $129.

Since October of 1987 Apple has included Apple File Exchange (AFE) with every version of system software as a means of transferring files to and from IBM PCs and other machines. AFE requires translators to convert the files first. Apple supplies a few, but it's generally left up to third-party developers. Systems Compatibility's Software Bridge does just this.

Software Bridge Macintosh translates documents created in Microsoft Word 4.0, MacWrite II 1.0, WordPerfect 1.0, and 3 other Macintosh text formats (ASCII, DCA/RFT, and Microsoft RTF) to and from 24 PC word processing formats. Translators are also included for exchanging files among the 3 Macintosh word processors. At press time files in Microsoft Word's Fast Save format could not be translated, although an upgrade is supposed to fix this. A workaround to the problem is supplied in the Read Me file.

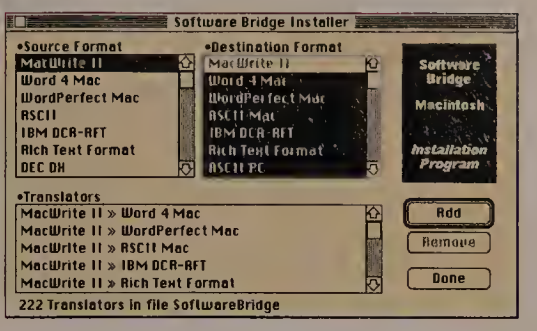
Enhanced Exchange

Software Bridge Installer, which you must copy into the Apple File Exchange folder, is a utility used to install translators for use in AFE. To do this you first select a source format and then select destination formats. Your choices are added to a scrolling list labeled Translators (see "Instant Installation"). The only wrinkle in this simple process is that you must ⌘-click to select or deselect multiple items, rather than Shift-click.

With the appropriate translators installed, all that remains is to launch AFE and begin translating. This is no more complicated than navigating a few scrolling lists. Instructions for using AFE are included with the documentation accompanying the Mac's system software, as well as in the Software Bridge manual.

When a PC is the source or destination, the easiest way to transfer files is through the SuperDrive, Apple's high-density floppy disk drive. When used with AFE, instructions in the Mac's ROM let this drive read DOS files on DOS-formatted 3½-inch disks.

Working on a 386SX clone, I created a PC Word 5.0 file that contained codes for centering, bolding, italics, underline, strikethrough, justification, margins, indents, tabs, superscript, subscript, plus a footnote and various point sizes. I transferred the file via the SuperDrive, then translated the document into the three Macintosh word processors supported by Software Bridge Macintosh, and opened each file in turn. In each case, all of the formatting was retained. A Mac Microsoft Word–to–PC WordPerfect translation was equally successful, except for the font, which wasn't available to the PC. Graphics can only be transferred with a Mac-to-Mac file transfer, but I succeeded in making both a WordPerfect-to-Word and a Word-to–MacWrite II graphics translation.



Instant Installation Installing translators in Software Bridge is easy once you remember to ⌘-click to select and deselect multiple items. Here the MacWrite II translators are added. The translators are available to the user when Apple File Exchange is launched.

Talented Transfer

Software Bridge outperformed Word for Word Mac, another file-transfer program (see *Reviews, Macworld,* December 1990). Word for Word Mac has translators that Software Bridge Macintosh doesn't have (notably one for translating PC Excel files for use in Mac word processors, plus several versions of ASCII), but Software Bridge is easier to use because it completes transfer and translation in one operation. Word for Word Mac, in contrast, assumes that you've already transferred the files you're going to translate.

Software Bridge supports only the current versions of Microsoft Word, MacWrite II, and WordPerfect. People with documents written using an earlier version, or who use WriteNow, Nisus, FullWrite Professional, or other word processors will have to look elsewhere, or first translate their files to ASCII. According to the company, translators for Word 3.02 and WriteNow may be the next produced for Software Bridge Macintosh.

Finally, although the packaging claims, in underlined copy, that Software Bridge will make "exact" translations, the manual denies that it can perform this feat. And to make the point clear, 17 of the manual's 64 pages contain listings of things that the translators can't translate such as some font-dependent Mac characters, and (except in Mac-to-Mac transfers) outline and shadow-formatted text. Even so, most users will be happy with the good document translation that Software Bridge delivers.—**Philip Bishop**

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Scientific and Business Graphing

MACGRAPHX 1.0

Pros: Fast, flexible graphing program; superior interface and data-import extensions. **Cons:** No exotic chart types.
Company: Bravo Technologies.
Requires: Mac Plus; System 6.0.3.
List price: $199.

A new graphing/charting program for the Mac world better have a pretty good excuse for existing. Not only have the charting capabilities built into spreadsheets improved since the first releases, but there's no shortage of competent graphing packages for both business and science. Into this crowded market Bravo Technologies, developer of the spreadsheet MacCalc, has now introduced MacGraphX. Amazingly enough, Bravo has found a way to distinguish itself, chiefly by offering speed and interface advantages over its competitors.

Seven Easy Pieces

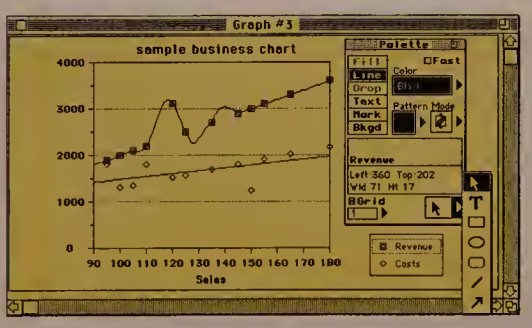
At first the MacGraphX package seems Spartan. It gives you seven standard chart types: scatter, line, area, bar, stacked bar, and pie charts, as well as a "table" chart. It does, however, lets you play a few tricks to expand this humble list. A transpose function sets the bar charts sideways (giving the type of chart other programs call column), and simply holding down Shift when selecting a new graph from the Graph menu lets you overlay any of the graph types. Since overlaying lets you mix line and bar charts, for example, you can generate more chart types, and using transformations of variables (logarithms and most arithmetic functions, as well as financial functions, are available) you can produce more types yet. There's no obvious way to make the equivalent of polar charts, but with a little labor you can produce most of the charts listed as separate types in other programs.

The workarounds for chart-type proliferation are evidence that Bravo thinks it's more important to do a good job on the basics than to provide a huge fixed menu of charts, and convenience in charting basics is MacGraphX's real strength. All the chart elements are independent objects; all the objects can be manipulated directly through menu commands rather than dialog boxes; and the graphic aspects of all the objects can be manipulated even more quickly using the Palette tool kit in the charting window (see "Little Helpers").

To create a chart, you enter data or import tabbed-text, WKS, SYLK, Excel, or MacCalc files into MacGraphX's spreadsheet-style format. You then select an *x*-axis data set (the cursor becomes a little horizontal bar) and some *y*-axis data sets (the cursor changes to a vertical bar), drag to select the data you want to graph, and choose a graph type; the program pops open a window with your graph. For creating basic chart types, the program is two to six times faster than Excel, DeltaGraph, or CA-Cricket Graph. To modify a graph, simply click on any graph element to move it around, or double-click and a dialog box appears where you enter and change Data. Redraw speed is more than just a convenience: as you step through the process of axis scaling, major- and minor-grid tinkering, and text adjusting needed to transform an on-screen plot into publication-ready hard copy, you find that MacGraphX saves you serious amounts of time. Furthermore, the interface is "expectation-friendly"—the features are self-explanatory and work exactly the way you expect. It's simple to get final output looking exactly right.

Down to Business

For tailoring black-and-white laser-printed graphics for publication, MacGraphX is a clear leader, and you can edit its output easily with the Palette tool kit to take advantage of color printers (the program takes no explicit notice of the existence of plotters). MacGraphX also produces a superior version of the graduated color fills popular in business presentation graphics, and it offers letterhead and layout features for producing standard graph templates and for publishing groups of charts. Business users who have grown to love exploded pie charts, 3-D bar charts, and scalable elements, however, will be disappointed to find these favorites missing. The reason for their absence is revealing. Most authorities on the graphical display of data maintain that these tools lend themselves readily to misrepresentation of relative quantities. Bravo, in a display of purity of intent that will win applause from Edward Tufte and graphing authorities everywhere, if not from this month's sales manager at G-Whizz Products, specifically declined to include them (shadowed bar charts are the only concession to 3-D glitz).



Little Helpers MacGraphX has put all its color-modification capabilities into a palette rather than menus or dialog boxes. The Fast check box lets you turn off backgrounds for faster screen redraw. That's a little selection of drawing tools at lower right in the figure, and a cubic spline fit through the upper data set!

This otherworldly approach to marketing is apparent in other MacGraphX features as well: file format specifications are included in case you have a special format you need to import, and C language files are provided to assist you in developing extensions to MacGraphX's basic curve-fitting and statistical capabilities. This open data architecture is likely to appeal to graduate students who want to automate parts of their thesis production, but it might not be immediately valuable to the user who needs a market-projection chart by 9:00 tomorrow morning.

If you find yourself occasionally spending hours tuning up sets of graphs, you are going to like MacGraphX. It is not only faster than competing products, but many refinements in its interface make it a pleasure to use. It doesn't have a large range of built-in graph types, but the graphs themselves are remarkably easy to modify. Designed in close adherence to the most enlightened current thinking about data display, it's worth a close look if you're serious about graphing.—**Charles Seiter**

See **Where to Buy** *or circle 664 on reader service card.*

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WINDOW SHOPPING

by Lawrence Stevens

This month I look at tutorials, floppy disk catalogers, and list managers

Algebra I Homework Tutor 1.9.4

Algebra I Homework Tutor ($99.95 from Missing Link Software) is the best algebra tutorial program I have seen. First, it works with algebra problems that the student types in from his or her own textbook. Second, it can generate an unlimited number of random algebraic problems.

The software includes an editor for entering algebraic notations. After a student enters an algebra problem and begins typing the steps leading to a solution, the program automatically evaluates each step. The tutor enters a single check if the step is correct; an *x* if the step is incorrect; a check and a question mark if the step could eventually lead to the correct solution; and a double check for the correct solution. The student can request a series of hints to help find the solution at any time.

To create random problems (for use without a textbook), the student first selects the type of problem (Laws of Exponents, Monomial Operations, Multiplying Binomials, and so on), then chooses from a number of options (With Integers, With Decimals, Inequalities), and finally clicks on a difficulty level (Easy, Medium, or Hard).

The ability to generate an unlimited number of problems puts Algebra I Homework Tutor in a class by itself.

Alge-Blaster Plus 1.0

Alge-Blaster Plus ($59.95 from Davidson & Associates) doesn't work along with a student's textbook—in effect, it is the textbook.

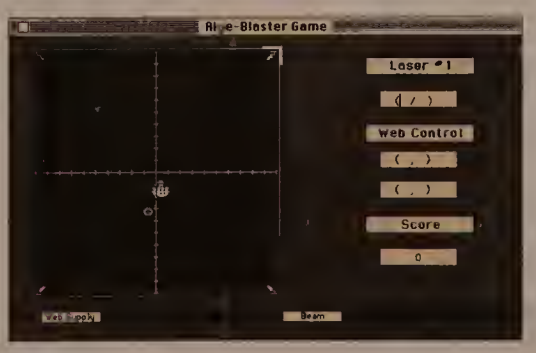
Alge-Blaster Plus presents a series of lessons that teach basic to intermediate concepts of algebra. It includes examples, a graphing module, and an algebra game.

RON CHAN

Alge-Blaster Plus lets students work at their own pace and needs little teacher involvement. Some instructors might prefer this approach over a traditional textbook whose problems must be graded by the teacher.

Your Personal Trainer for the SAT 1.0

Scholastic Aptitude Test (SAT) scores can be improved when students are taught strategies for finding solutions to different types of test problems and are given a chance to practice on sample questions. Your Personal Trainer for the SAT ($59.95 from Davidson & Associates) includes dozens of hints for obtaining a higher score, provides plenty of example questions, and has charts for tracking progress.



Making Algebra Fun Alge-Blaster combines algebra practice with the thrill of a video game. Students enter coordinates in the boxes on the right to erect barricades to prevent the bomb from hitting the edge of the game area and exploding.

There are five sections to this package. The Assessment section lets the student take a practice verbal or math SAT test under timed conditions. Unfortunately, the student has to read the test questions in the book that comes in the package and mark the answers on the screen. The program, however, gives an immediate score and recommends areas to practice.

The Vocabulary, Reading, and Math sections display sample questions, one at a time, along with general hints on how to find the answers.

The final section is a game in which you try to capture blocks before they disappear by answering questions about test-taking strategies.

Your Personal Trainer for the SAT provides 40 hours of instruction, which is about equal to an SAT course. While nothing can substitute for a teacher, Your Personal Trainer for the SAT is the next best thing.

Professor Mac 1.7

Spend a couple of days with Professor Mac ($49.95 from Individual Software) and you'll be familiar with Mac hardware and software. Professor Mac vocalizes many instructions and is virtually idiot-proof; it lets you practice with real menu items such as Cut and Paste but doesn't allow you to make a mistake (see "Mac Practice"). Professor Mac covers all basic Mac operations, such as creating folders, as well as intermediate topics, such as Font/DA Mover and the basics of HyperCard.

Like most tutorials, Professor Mac doesn't allow you to skip around. But

(continues)

if you like the disciplined approach, the program can help you learn how to use a Mac.

MusiCard Maker 1.0

MusiCard Maker ($49.95 from Intellimation) helps you produce handsome musical notation on cards in a HyperCard stack. The program provides a tool for virtually every musical symbol: notes, bowing symbols, clefs, rest signs (see "Point-and-Click Musical Notation"). You select the appropriate tool from a palette, and a simple mouse-click places the symbol where you want it. Standard HyperCard tools such as the lasso, eraser, and text tools are included.

The program plays any note or melody you enter on the screen, but each screen holds only a few notes. MusiCard Maker, like most HyperCard applications, is excruciatingly slow. After you click on the location where you want a symbol, you have to wait five seconds for it to appear.

If you need to display a short, difficult musical passage, create flash cards for memorizing bars, or design displays for a music class, MusiCard Maker is excellent, but it can't replace paper and pencil or a MIDI system for composing or notating long passages.

MacPhoneBook 3.0

MacPhoneBook ($49.95 from Synex) allows you to create center-stapled hard-copy phone books with printing on both sides of a page. Three black covers are included with the program.

The program includes both a DA and an application. The DA allows you to find and add names as well as dial a number using a modem or automatic dialer. Using the application, you can sort a list according to any field or category, print labels, or export a text file.

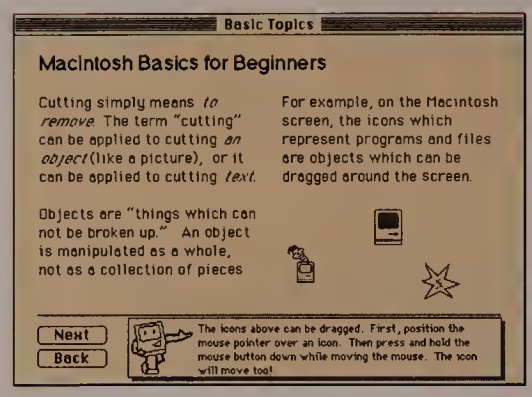
There are some disadvantages: you must enter each piece of data (first name, second name, and so on) in a separate field—a needless tedium if you never expect to sort by field. And if you need sophisticated Boolean searches, automatic elimination of duplicates, or other high-end database features, you won't find them here.

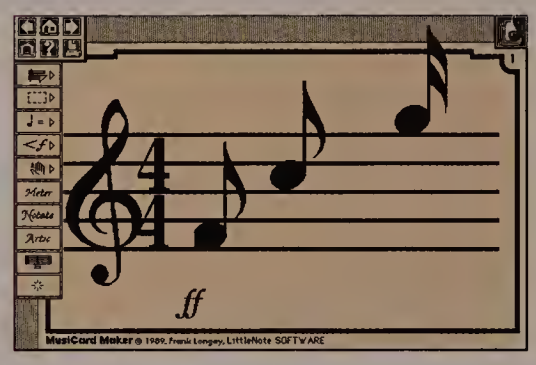
MacList 1.5

MacList ($79 from JAM Software) can, like MacPhoneBook, be used as an address book. But it's better to think of MacList as a database application. MacList allows you to find names using a Search facility and dial a telephone number using a modem or automatic dialer.

This DA is set up in rows and columns. As in Excel, you can change the size of columns, delete or add rows or columns, sort by up to three column headings in ascending or descending order, and calculate the sum of any column or row. MacList, however, lacks many of the spreadsheet features that make list manipulation easy. You cannot delete by category, eliminate duplicates, use mathematical operators such as the greater than symbol (>) in searches, or use data entry shortcuts such as Fill Down. But MacList is excellent if you need a cost- and memory-effective means of list manipulation.

Possibly the best use of MacList is to store data that you later export to a spreadsheet for manipulation. The program automatically uses the data in the top row as headings when you import. With MacPhoneBook, you have to enter headings manually.



Mac Practice Professor Mac provides practice along with instruction. After reading the information on this card, you have an opportunity to move the icons around using the mouse pointer.

Point-and-Click Musical Notation Each tool at the left of this screen in MusiCard Maker lets you enter a musical symbol. Many of the tools include submenus. For example, the note tool (third one down) allows you to select from any type of note.

Offline 1.01

Offline ($79.95 from SNA) allows you to catalog floppy disks so that you can view their contents without inserting them into the drive. You can search for files by name, type, or creator. The program also automatically generates labels for all cataloged disks.

Offline is similar to Cataloger (reviewed here in February). Cataloger, however, represents disks by disk icons, and it has a View menu with exactly the same options as the Finder's View menu has. Cataloger also has a few more searching options than Offline, including the ability to search for files that were modified before or after a particular date.

But the main difference between the two products is price—Cataloger is about half the price of Offline.

Disk Accessory Plus 1.0

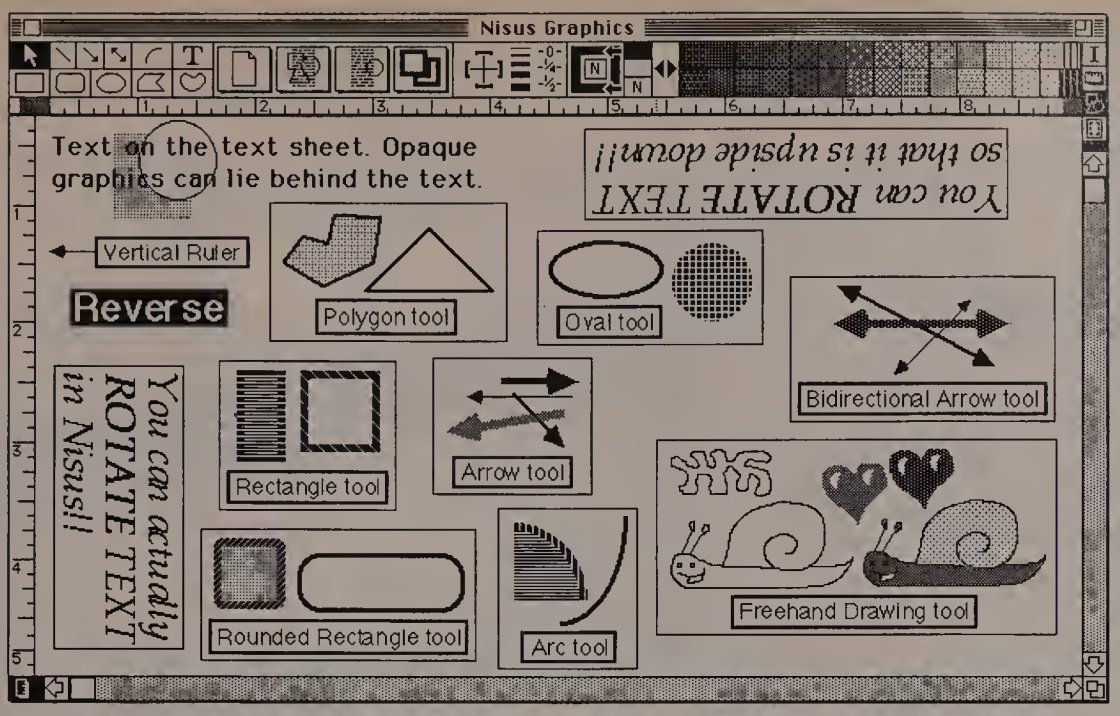
If you only want to print labels for floppies instead of creating an on-screen catalog, Disk Accessory Plus ($10 from Vertical Solutions) is a cost-effective option. In what is probably one of the best values in commercial Mac software, this $10 program automatically creates floppy disk labels with all the file and folder names on the disk.

Despite its price, Disk Accessory Plus has all the features you need: you can print the names of all files, all folders, both, or just the title of the disk; you can add or delete text on the label; you can insert an icon or PICT graphic; and you can print the disk name upside down on the spine (the area that folds over the edge of the disk).

The program even lets you perform some housekeeping duties such as duplicating, erasing, and formatting disks without using the Finder.

Vertical Solutions plans to release a new $10 software package every quarter (if you return the plastic case, included with your original disk, you will receive 50 percent off your next purchase). Disk Accessory Plus is a welcome first entry in what I hope will be a series of good low-cost utilities for the Mac. M

See Where to Buy or circle 605 (Alge-Blaster), 676 (MacList), 677 (MacPhoneBook), 685 (MusiCard Maker), 693 (Professor Mac), 716 (Your Personal Trainer for the SAT) on reader service card.



If a picture is worth a thousand words, then why not use a word processor that processes pictures too?

Nisus® lets you communicate the way the Macintosh works—with words and graphics

Most people aren't really interested in whether a program is a word processor, a graphics program, or a page layout program. All they really want to do is communicate.

Sometimes, something as simple as a note with an arrow attached is all you need to make your point.

Other times, a little grey background behind some text seems more appropriate. The tools you need to communicate come built into Nisus, or you can place a PICT graphic like the features list on the right.

Nisus lets you draw attention to electronic symbols or scientific notation. Text wraps around your callout box automatically.

You can "Place" any page of a Nisus file containing text and graphics into another Nisus file where it becomes a picture called a "Placed Page Graphic." Double clicking this "Placed Page Graphic" will open the original file for editing. Graphics can be drawn or pasted to three different layers: the text layer, behind the text, and in front of the text, giving you total control.

Nisus lets you rotate text, which is very important if you are designing a self-mailer that folds into three panels. Nisus also enables you to print two pages up—pamphlet style. So, for example, suppose you want to print two pages on a single 8 $\frac{1}{2}$ by 11-inch sheet of paper turned sideways. You can do it with Nisus by a simple selection. Perhaps more important, however, is that this same command will collate your pages—in an 8 page document, for example, page 1 and page 8 will lie next to each other!

CIRCUIT DIAGRAMS IN A NISUS® DOCUMENT

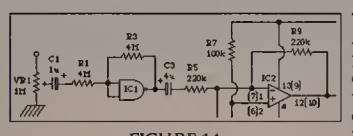


FIGURE 1A

This is a Laser TechFonts¹ diagram. As you can see, you can put a complicated diagram directly into your document. In this case, the diagram was drawn using specialized "draw" circuit fonts, along with the Scientific text fonts. These special fonts allow you to design a schematic quickly, using a draw or paint program, or a word processor with integrated graphics, such as Nisus®, the amazing word processor from Paragon Concepts, Inc.

SCIENTIFIC EQUATIONS WITHIN A NISUS® DOCUMENT

This is a section of Laser TechFonts¹ within a Nisus document $\frac{3}{2}x\frac{3}{2}^2(x^2-x)^3$ The first part of the equation, $\frac{3}{2}x\frac{3}{2}^2$, is an example of the Fraction font, which allows a fraction to be typed on one line of text The exponent 2 in the numerator is Fraction superscripted The second part of the equation, $(x^2-x)^3$, is an example of the Scientific font, with the exponents 2 and 3 in the SuperScientific font

You can type equations into Nisus using Laser TechFonts, and then put boxes around them These boxes, drawn using the Nisus graphics palette, call attention to examples and formulas This feature is perfect for writing manuscripts, exams and study guides

$$\beta = \frac{\sigma_{xy}}{\sigma_x^2} = \frac{\sum_{i=1}^{n} X_i Y_i - \frac{1}{n}\left(\sum_{i=1}^{n} X_i\right)\left(\sum_{i=1}^{n} Y_i\right)}{\sum_{i=1}^{n} X_i Y_i - \frac{1}{n}\left(\sum_{i=1}^{n} X_i\right)}$$

FIGURE 1

If you're new to the Macintosh word processing market, you probably want a word processor that is easy to use. If you've been around for a while, you undoubtedly want a powerful word processor. Chances are you have tried either MacWrite or Microsoft Word. 4.0. One is easy to use, the other offers power. Both, however, have severe limitations which is why we developed Nisus in the first place.

Nisus has a built-in word processing language which does for word processing what built-in languages do for databases. For example, the language allows you to develop routines to index all proper names, a method to find and correct all double words, periods, and extra spaces, or index every word in a document except those you specifically want to exclude. You choose the features.

Discover why Nisus is shipped with every Macintosh in Korea, why *MacUser U.K.* named Nisus "1989 Best Word Processor," and why *Macworld Australia* uses Nisus as its word processor of choice.

This two column format above is actually a separate Nisus file placed into the master file. This gives you total control over how you layout a Nisus document.

Nisus Feature Comparisons	NISUS 3.0	Word 4.0	WriteNow	MacWrite II
Built-in word processing language (GREP & macros)	■			
Noncontiguous text selection	■			
Unlimited column formats	■			
Find and replace or index	■			
Find any font, *style*, size, or color	■			▩
Place text or graphic linked to parent text or graphic file	■			
Find and replace in unopened files	■			
Cross reference text	■			
125,000+ user definable key commands	■			
"Super Style sheets"	■			
Automatic File Comparison	■			
10 editable clipboards	■			
Mark text as electronic book mark	■			
Built-in Graphics	■			
Rotate text and graphics	■			
Unlimited undos back to "open file"	■		▩	
Reads and Writes Microsoft Word Files	■	■	■	■
Vertical Ruler	■			

▩ Limited implementation

Free Brochure

Call today for your free complete brochure describing Nisus in detail. And while you're at it, ask yourself how many more words this ad—created in Nisus—would have taken without the pictures.

(800) 922-2993
Extension 800

PARAGON concepts, inc.
990 Highland Drive, Suite 312
Solana Beach, CA 92075
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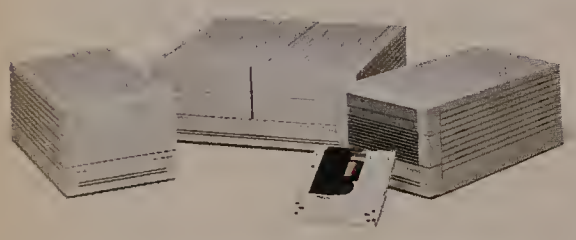
Circle 253 on reader service card

The New MacinStors® For The New Macs®.

Giant Steps. No Footprints.

The newest Macintosh® computers were designed to deliver leading edge technology in the most cost effective packages. With them, Apple has taken a giant step into the world of value. Frankly, it's a world in which we at Storage Dimensions have been doing business for some time now.



Our new slimline ZFP (zero footprint) models, for instance, reflect giant steps of their own – and leave no footprints. Tucked smartly under the Mac Classic,™ or just as smartly between the Mac si™ chassis and monitor, they're available in 50, 100, and 205 MB capacities. And they're among the fastest in the industry. What's more, they include comprehensive disk management software, with advanced features like disk mirroring and volume spanning.

In fact, features like these have always been included across the entire MacinStor product family. Whether it's a 650 MB internal or a 4 GB external. Whether it's an erasable optical solution or a hard disk standalone solution, every MacinStor delivers *more for your money.* Because Macintosh users expect more.

Take a giant step in performance, reliability, features, support and value. Ask for more than just storage. Ask for Storage Dimensions. Call (408) 879-0300. Storage Dimensions, 2145 Hamilton Avenue, San Jose, CA 95125.

STORAGE DIMENSIONS

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To be called Circle 176 on reader service card

For literature circle 127 on reader service card

NEW PRODUCTS

Edited by
Mary Margaret Lewis

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

HARDWARE

The Air Mouse

Remote Mac input device that combines the use of a patented sensor with digital infrared technology. Enables the user to select all of the display system's functions from on-screen menus. Works with an AirMouse base station that sits on top of or beside the video screen and connects to the mouse or digitizer port on the equipment. $450 to $500. Selectech, 617/383-0128.

ATTO Cache ci

64K static-RAM-cache board that is designed to increase the speed of the Mac IIci by 40 to 70 percent. Takes advantage of the fact that programs access some small portions of code and data more frequently than others; stores the frequently used data in 25-nanosecond static RAM until needed by the 68030 processor. Plugs directly into the 120-pin cache connector on the Mac IIci; includes optional cache-control. $279. Atto Technology, 716/688-4259.

ATTO Cache ci

CS-1 Control Station

Hardware control interface for disk-based recording systems, sequencers, and multimedia software. Acts as an input device when used with Digidesign's Sound Tools and Audiomedia and with Opcode's Vision and Mark of the Unicorn's Performer sequencers. Keys are programmable, and unit is built with a scrub wheel that enables precise positioning within a recording for scrub editing. $599.95. JLCooper Electronics, 213/306-4131.

CS-1 Control Station

MacClassic 3 Meg Module

3MB expansion board for the Mac Classic. $175. Technology Works, 512/794-8533, 800/688-7476.

SampleCell

Stereo, 16-bit, 16-voice, 8-channel output, sample-playback board for the Mac II series. Enables musicians to play digitally recorded or sampled instruments from a computer for use in MIDI, recording, and audio post-production applications. Supports up to 8MB of Mac II RAM. Works with all MIDI Manager–compatible programs. $1995; with 8MB of RAM $2005. Digidesign, 415/688-0600.

SampleCell

Scan 300/Color

24-bit color and gray-scale scanner that produces gray-scale, halftone, and line-art images. Includes scanning software with features for scaling and zooming, controls for brightness and contrast, and a gray map for manipulating scanned images. Requires Mac interface kit that comes with Adobe Photoshop. $1995; Mac interface kit $495. Abaton, 415/683-2226.

Scan 300/Color

SRM-3/Mac Modem

Portable modem that does not require AC power but is powered directly from the Macintosh. Weighs 1.1 ounces and is less than 2½ inches long. May be ordered with a variety of connectors such as terminal block, RJ-11, or RJ-45. $70. RAD Data Communications, 201/587-8822.

SRM-3/Mac Modem

TelePort/Fax

Fax modem that connects directly to the ADB port. Includes MNP Level 5 data compression, performs as a background operation, transmits facsimiles at 4800 bps, and is Hayes compatible. Data is transmitted at 300 bps, 1200 bps, or 2400 bps. $265. Global Village, 415/329-0700.

True-Color Hand Scanner

Color wide-width hand scanner that comes with an OCR and color-paint application. Built with proprietary design developed for the multimedia, graphics, and animation markets. Unit is a SCSI device that scans images up to 4.1 inches wide at 100 dpi to 400 dpi and at 200 dpi in halftone mode, with a scanning speed of 3 seconds per pass. Uses automatic gamma correction. $699. Animas, 714/590-3334.

(continues)

XCeed NB12-108 Video Card

Multiple-resolution video board for the Mac II series. Has dual-page image capabilities; works in 1-, 2-, 4-, or 8-bit mode; provides 256 simultaneous colors; functions in multiple-monitor environments. Designed to take advantage of the high refresh rates of 19-inch screens. $719. Micron, 208/383-4000.

XCeed NB12-108 Video Card

SOFTWARE

3 in Three

Puzzle with more than 80 configurations ranging from word puzzles to graphical puzzles in which the player rearranges pieces to produce an image. Includes logic puzzles, word jumbles, and elevator puzzles. All games center around the odyssey of a character based on the number 3. This character falls out of a fictitious spreadsheet during a power surge and spends all of her time trying to find a way back. If the player masters all 80 of the puzzles, 3 gets back home. Comes with a hint book. 1MB min. memory. $49.95. Cinemaware, 805/495-6515.

3 in Three

4D Calc

Spreadsheet module for integration into a 4th Dimension database. Allows spreadsheets to be actively associated with a specific record in a database. Includes a business graphics package called 2D Graph. 512K min. memory. $295. ACIUS, 408/252-4444.

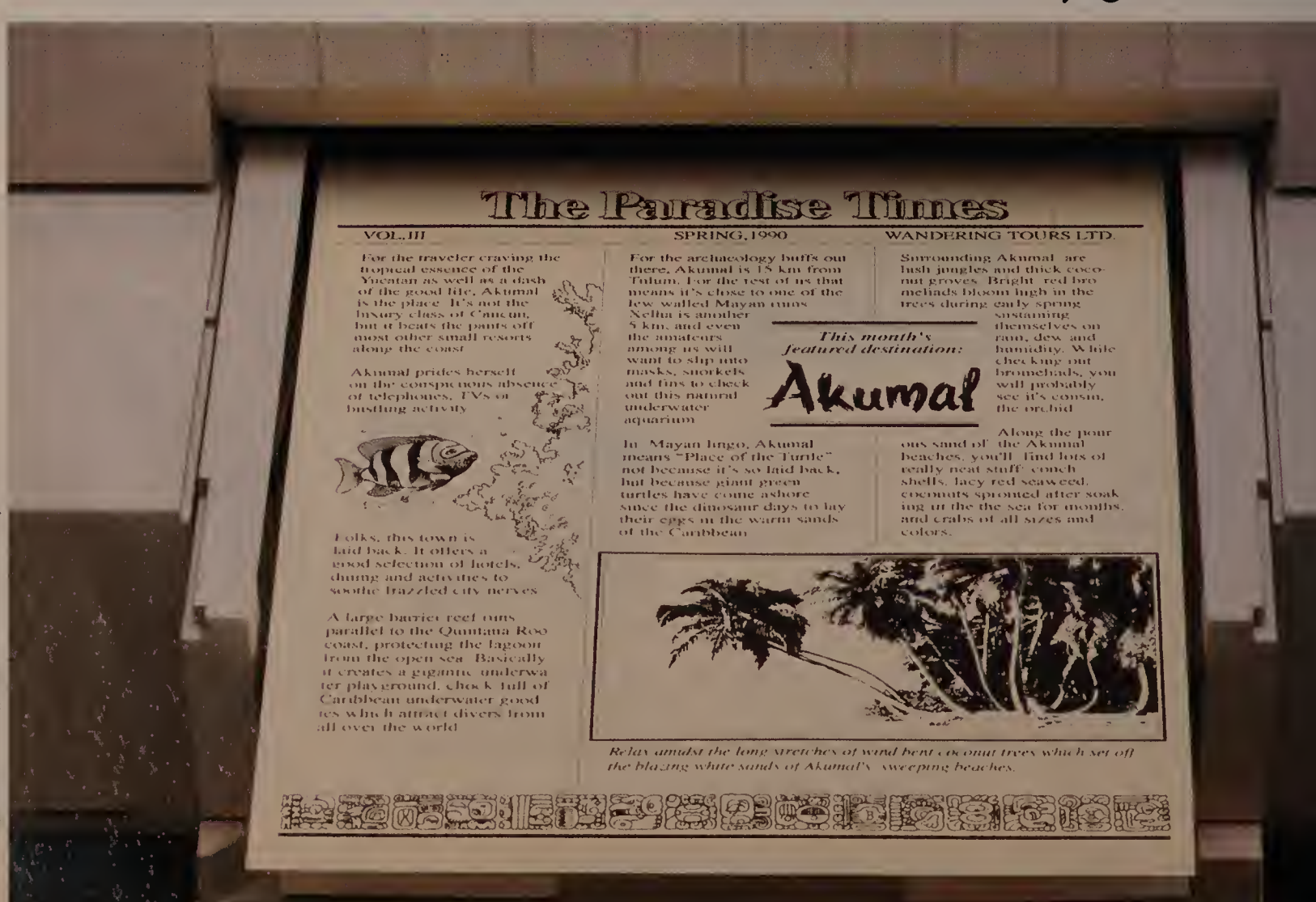
DBMS/Copy Mac with PC-Access

Data-translation software designed for two-way conversion between files created in various Mac and PC applications. Works with 12 major Mac applications including Excel, Works, FoxBase+/Mac, and Oracle, and is compatible with 65 similar PC applications. Supports any form of ASCII file. DBMS/Copy Mac Lite performs PC-to-Mac file conversion using the 12 Mac applications in DBMS/Copy Mac with PC/Access, but supports only 26 of the PC applications. DBMS/Copy Mac supports only the Mac software packages. Retains variable names and formatting during file conversion. 512K min. memory. $290; DBMS/Copy Mac $95; DBMS/Copy Mac Lite $185. Conceptual Software, 713/667-4222, 800/782-8969.

DitchBuilder and ReproLog

Sets of Microsoft Excel templates designed by a landscape architect. DitchBuilder is a set of templates for design and documentation of trapezoidal, triangular, and parabolic section ditches, channels, and swales. ReproLog is a set of templates for organizing and tabulating billable reprographic expenses such as photocopying, blue-

With the HP DeskWriter, you can



*Suggested U.S. list price. © 1990 Hewlett-Packard Company PE12005
Documents created using Microsoft® Word and Aldus PageMaker®.
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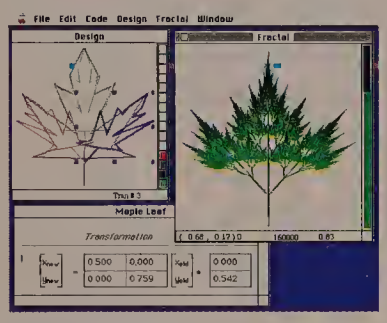
printing, laser printing, and faxing. 1MB min. memory. DitchBuilder $99; ReproLog $24. StormWorks, 919/834-9420.

Expert Backgammon

Backgammon game that has multiple skill levels from novice to expert, has the ability to store and recall games and positions, can be played in tournament or single-game mode, and evaluates your chances of winning from any position. Program can print a list of the moves in a game, in standard notation, and can randomly generate dice rolls. 512K min. memory. $65. Komodo Software, 415/941-7784.

Fractal Attraction

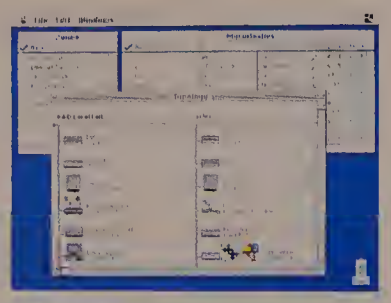
Program for designing fractals using iterated function systems. User manipulates transformations by pointing, clicking, and dragging in a draw/paint-like window. The resulting fractal is generated in another window. Tool renders color using IFS transformation. User can base fractal design on imported images. Intended for education or graphic design. 1MB min. memory. $49.95. Sandpiper Software, 612/644-7395.



Fractal Attraction

GraceLAN

AppleTalk network-management tool that enables network administrator to view all nodes on a net-



GraceLAN

work. Can be used to view machine type, RAM size, hard drive volume size and available space, System file and printer versions, active applications, available applications and their versions, INITs and cdevs, DAs and fonts, NuBus boards, and SCSI devices. Data can be exported into spreadsheets and can produce management reports. 1MB min. memory. 50-user set $395; 50 additional users $195 each; corporate version for 200 or more Macs $995. Technology Works, 512/794-8533, 800/688-7476.

Home Fitness Consultant

Application designed to help set up a fitness program at home. Accommodates up to six users, with optional password protection for each. Contains modules for body-composition analysis, fitness training, nutritional analysis, activities planner, status and goals, graphs, and a note pad. Food portion of program developed by a registered dietician. 1MB min.

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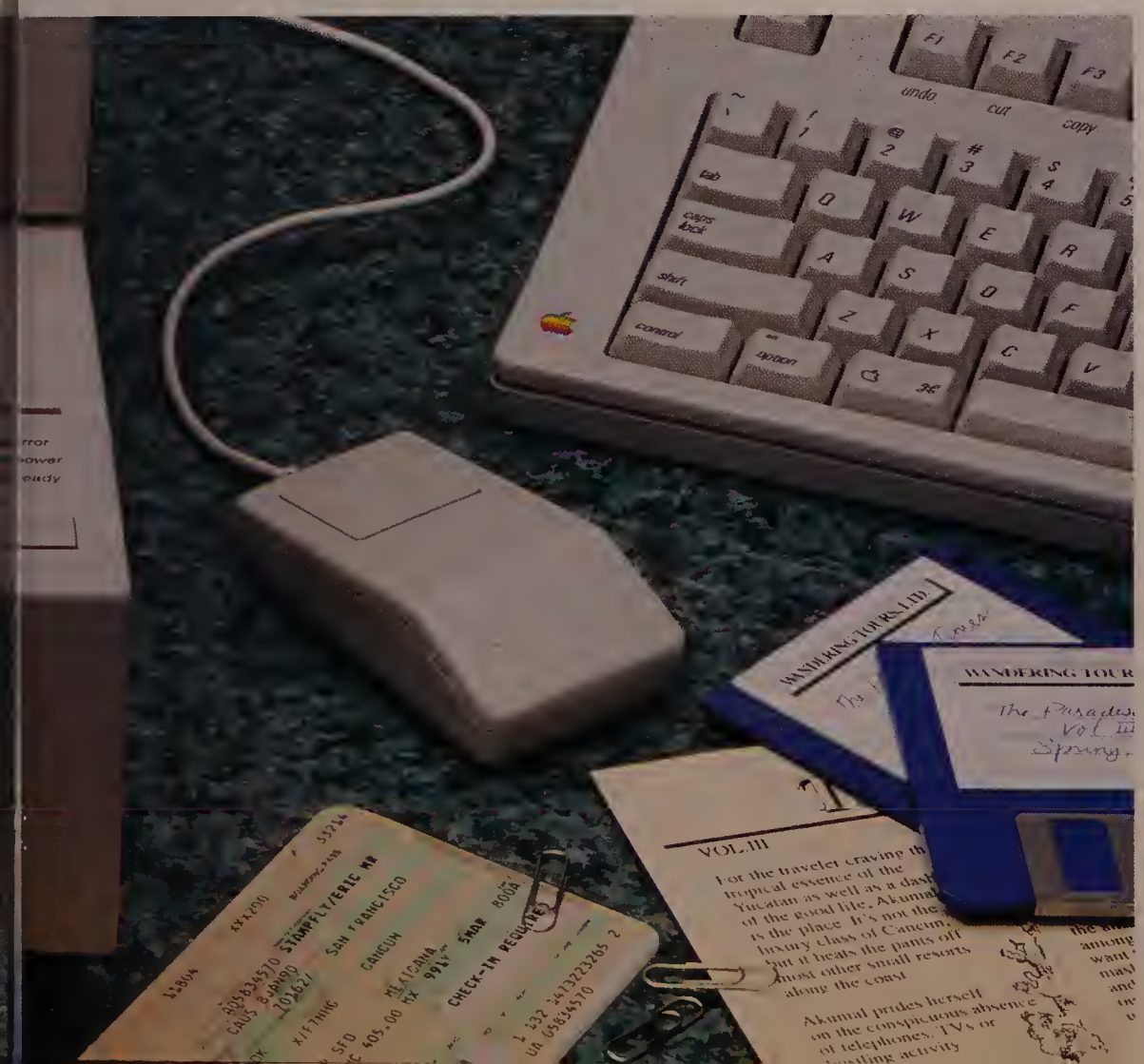
Home Fitness Consultant

have it all. (But keep it to yourself.)



The HP DeskWriter printer puts laser-quality printing right at your fingertips.

With a small size and a $995* price tag, the DeskWriter printer easily fits on your desk and in your budget. And its advanced 300 dpi inkjet technology lets you print sparkling text and detailed graphics.

The DeskWriter is also designed for easy use with your Macintosh, and has both serial and Apple Talk interfaces. It even includes scalable and outline fonts. Combine that with the DeskWriter's whisper-quiet operation, and keeping it to yourself will be that much easier. So call **1-800-752-0900, Ext. 1004** for your authorized HP dealer.

There is a better way.

HEWLETT PACKARD

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With the HP DeskWriter, you can

The Paradise Times

VOL. III — SPRING, 1990 — WANDERING TOURS LTD.

For the traveler craving the tropical essence of the Yucatan as well as a dash of the good life, Akumal is the place. It's not the luxury class of Cancun, but it beats the pants off most other small resorts along the coast.

Akumal prides herself on the conspicuous absence of telephones, TVs or bustling activity.

Folks, this town is laid back. It offers a good selection of hotels, dining and activities to soothe frazzled city nerves.

A large barrier reef runs parallel to the Quintana Roo coast, protecting the lagoon from the open sea. Basically it creates a gigantic underwater playground, chock full of Caribbean underwater goodies which attract divers from all over the world.

For the archaeology buffs out there, Akumal is 15 km from Tulum. For the rest of us that means it's close to one of the few walled Mayan ruins.

Xelha is another 5 km, and even the amateurs among us will want to slip into masks, snorkels and fins to check out this natural underwater aquarium.

This month's featured destination:

Akumal

In Mayan lingo, Akumal means "Place of the Turtle" not because it's so laid back, but because giant green turtles have come ashore since the dinosaur days to lay their eggs in the warm sands of the Caribbean.

Surrounding Akumal are lush jungles and thick coconut groves. Bright red bromeliads bloom high in the trees during early spring, sustaining themselves on rain, dew and humidity. While checking out bromeliads, you will probably see it's cousin, the orchid.

Along the pour ous sand of the Akumal beaches, you'll find lots of really neat stuff: conch shells, lacy red seaweed, coconuts sprouted after soaking in the the sea for months, and crabs of all sizes and colors.

Relax amidst the long stretches of wind bent coconut trees which set off the blazing white sands of Akumal's sweeping beaches.

Actual size 1 2 - half price. © 1990 Hewlett-Packard Company PE12005
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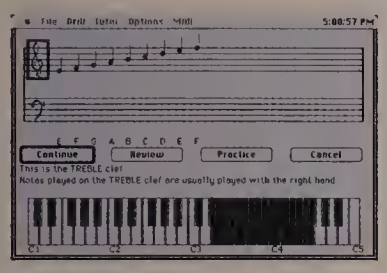
drills, exercises, and tutorials to teach keyboard skills, music theory, and ear training. Part II: Scale Master teaches musical scale construction. 512K min. memory. $79.95 each. Digital Horizons, 503/622-4034.



Note Wizard and Scale Master

Oasis

Graphics software that enables artists to produce images on screen with tools that simulate brushes and ink pens. Lets user apply color to backgrounds and retouch existing color images using solid brush, tint, colorize, saturate, smear, and other options. Brushes

Oasis Image

come with size, shape, and density attributes; lines, shapes, fill patterns, and gradations can be varied. Images can be rotated, reflected, and cropped. 5MB min. memory. $795. Time Arts, 707/576-7722.

Pink SQL

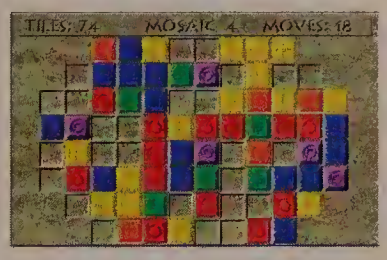
Relational database-management system that is based on ANSI SQL standards. Functions as a client/server system and contains links with a variety of front-end applications, such as HyperCard and 4th Dimension. 2MB min. memory for server; 1MB min. memory for clients. Server with five clients $2275; each additional client $375; developer package $1590. MacVonk, 215/667-9781.

RésuméMaker

Software helps create résumés and cover letters. Contains hints on interviewing and successful job searching. Offers three résumé types—chronological, functional, and performance—and eight formats. 1MB min. memory. $49.95. Individual Software, 415/595-8855.

Tesserae

Puzzle game in which users eliminate tiles from a board by positioning them according to their color and texture. Has beginner through advanced levels of difficulty and a variety of board configurations. 1MB min. memory. $49.95. Inline Design, 203/364-0063.



Tesserae

VTXpress

Mac interface to VAX VTX, Digital Equipment Corporation's videotext product for electronic information distribution. Application directly accesses the VTX server to reduce overhead on the host system and eliminate the need for an individual account for each VTX user. Supports a range of graphic formats and enables users to simultaneously view multiple VTX

(continues)

got it made in the shades.

*Suggested U.S. list price. ©1990 Hewlett-Packard Company PE12004

Infobases. 2MB min. memory $399. White Pine Software, 603/886-9050.

Wizardry II: Knight of Diamonds

Player pilots characters introduced in Wizardry I: Proving Grounds of the Mad Overlord through a 3-D, graphic maze in search of the five fabled pieces of the Knight of Diamonds' armor and ultimately the Staff of Gnilda. 512KE min. memory. $49.95. Sir-Tech, 315/393-6633.

Xdata

Data-publishing extension for QuarkXPress 3.0. Enables user to flow data through exactly positioned text boxes for precise alignment to forms or labels. Can conditionally include or exclude one or more fields or other static text based on the value of a field or subfield in the current or previous record. Imports more than 1000 standard address records per minute on a Mac II and is MultiFinder compatible. 1MB min. memory. $199. Em Software, 203/399-8472.

ACCESSORIES

Baby's First Computer

Squeezable, nontoxic toy computer for children.

Baby's First Computer

Comes in yellow or blue. $9.99. Remote Control Systems, 703/548-8983.

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Retractable, height-adjustable keyboard holder that fits under a work surface, including steel-framed desks and credenzas that are at least 18 inches deep. Unit retracts under the work surface when not needed. Gear-shift lever enables user to adjust and lock the height to a position that is comfortable. $149.95. Forminco, 514/347-1524, 800/662-3345 ext. 522, 800/245-0035 ext. 522 in New York.

The Big Difference

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Portable briefcase for carrying Ehman, Cutting Edge, PowerDrive, PLI, and other major manufacturers' disk drives, plus power and data cables. Contains a compartment that can store four removable-media 44MB disk cartridges. Case is made of ballistics-type material with foam padding; closes with a zipper. $79.95. Thinker Toys, 805/496-3246, 800/368-4777.

Komfort Wrist Rest

Device designed to help protect keyboard users from carpal tunnel syndrome and repetitive strain injury. Consists of polyurethane foam, covering modeled plastic. Unit can be

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adjusted to three positions. $35. JMJ Enterprises, 714/472-4409.

LC-1200 Line Conditioner

Voltage regulator and power-line conditioning unit for computers and electronic equipment. Provides 1200 watts from four isobar-spike-protected AC-output receptacles. Filter banks protect equipment. Comes in a compact cabinet and has a 12-amp circuit breaker, an AC power cord, and a two-year warranty. $249. Tripp Lite, 312/329-1777.

LC-1200 Line Conditioner

Portable Inventory System

Hand-held portable inventory system designed for off-line data entry that can be downloaded to the Mac. Program ships with two-field data-collection software, but works with software that records from one to four data fields. Data is input either by scanning bar codes or pressing keys on the unit's keypad. System can store up to 2000 records before being downloaded to the Mac. $995. Percon, 503/344-1189, 800/873-7266.

Wristsaver

Wrist support designed to provide a comfortable typing environment and help reduce the risk of carpal tunnel syndrome. Lightweight 18-inch-by-3-inch foam-covered device lifts the wrists approximately 1 inch above the desk surface. $15. LB Innovators, 619/423-6644.

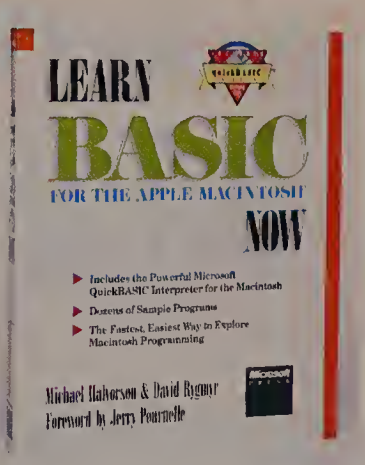
BOOKS

Build Your Own Mac Book

Guide to assembling a Macintosh from catalog parts. Includes tips section and more than 80 photographs and illustrations. Written by Bob Brant. $17.95 plus $3 s/h. Brant Associates, 503/659-3670.

Learn BASIC for the Apple Macintosh Now

Book designed to teach BASIC programming concepts and how to write programs in BASIC. Includes sample programs, a section with questions and exercises, and the QuickBasic Interpreter companion disk. Written by Michael Halvorson and David Rygmyr. $39.95. Microsoft Press, 800/677-7377. M



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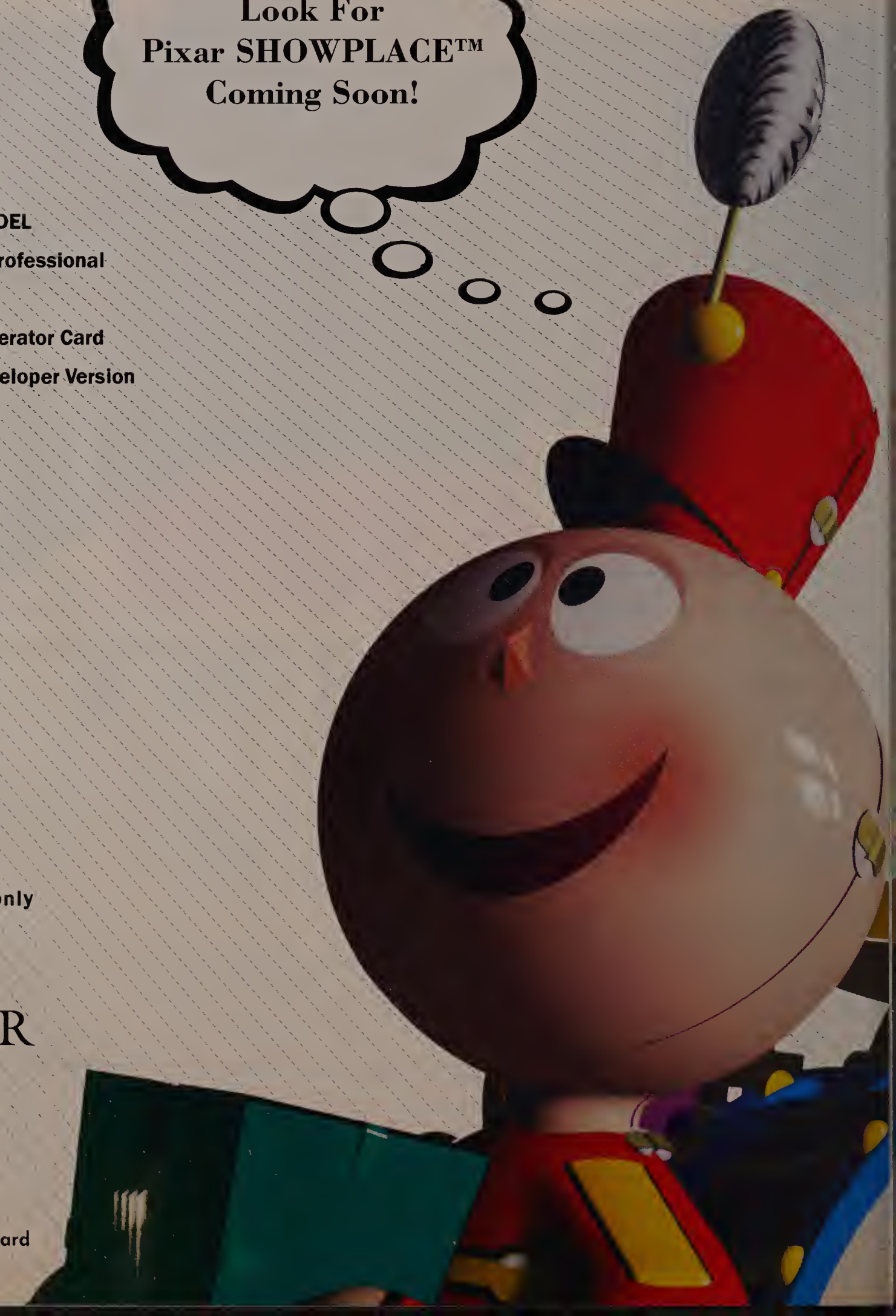

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Circle 356 on reader service card

Quick Tips

SCANNING SLIDES CHEAPLY, IMPROVING LASER-PRINTED GRAYS, ELIMINATING VIRAL PLAGUE, AND MORE

BY LON POOLE

The version of HyperCard that comes with every Macintosh has always been set initially to user level 2 (Typing). Accessing the higher levels of Painting, Authoring, and Scripting used to be a simple matter of changing a setting on the User Preferences card of the Home stack, but no longer. Now you must type the word *magic* (and press Return) in HyperCard's message box before you can select a higher user level on the User Preferences card. To use the message box, choose Message from HyperCard's Go menu.

The minimal HyperCard documentation included with a Mac doesn't explain how to use the higher levels. However, an assortment of books is available on the subject. Also, Claris sells two HyperCard products that include manuals and 19 example and reference stacks not bundled with the Mac. One of these products, the HyperCard 2.0 Upgrade ($49 directly from Claris at 800/628-2100), includes a script-language guide. The other product, HyperCard 2.0 Development Kit ($199 from Claris dealers), includes the script-language guide and four other manuals—over 1400 pages in all. The version of HyperCard that comes with these two Claris products doesn't require a magic word to access higher user levels.

Answers from Apple

Apple still doesn't want to answer your questions about Apple products directly. You're supposed to ask an Apple dealer, a school support center, a user group, or a consultant. If those sources can't help you (as has all too often been the case in the past), you can now call Apple's toll-free customer support phone line at 800/776-2333 from 6 a.m. to 5 p.m. Pacific time. Before calling, though, prepare a description of the problem and a list of the software and hardware you're using. Be prepared to cite the support sources you've already stumped and what their responses were. If you call the support line and are unable to provide this information, all you'll get is Apple's toll-free number (800/538-9696) for locating dealers and user groups.

Clearing the Desktop

The discussion in last December's *Quick Tips* about desktop icons being obscured when you're using MultiFinder struck a responsive chord with Mike Berger of Salem, Massachusetts. When he first started using MultiFinder, he was distressed by the system's inability to provide clean wipes when switching programs. Then he discovered that AlSoft's MasterJuggler utility can hide an application's windows when you switch to another program. If you always switch programs using MasterJuggler, you will get an unobstructed view of the desktop when you switch to the Finder. You switch programs using MasterJuggler's Application List or Application pop-up menu, as described in the MasterJuggler manual (see "Hide and Switch").

Works to FileMaker

Q I have a database of my cassette collection, created in Microsoft Works. I would like to transfer the information from the Works database to FileMaker. Is this possible?

Dave Bruno
Philadelphia, Pennsylvania

A Yes. Export the information using Works' Save As command (File menu). In the Save As dialog box, select the Export option, type a file name, and click the Save button. If you wish to export only certain records from your Works database, use the Match Records or the Record Selection command (both in the Organize menu) to select the records you want to export. Then, in the Save As dialog box, select the Save Selected Records Only option before clicking Save.

In either FileMaker II or FileMaker Pro, create a new database to hold the information; its structure does not have to be the same as the Works file's. Then use the Import command (File menu) as described in the FileMaker manual to import the information,

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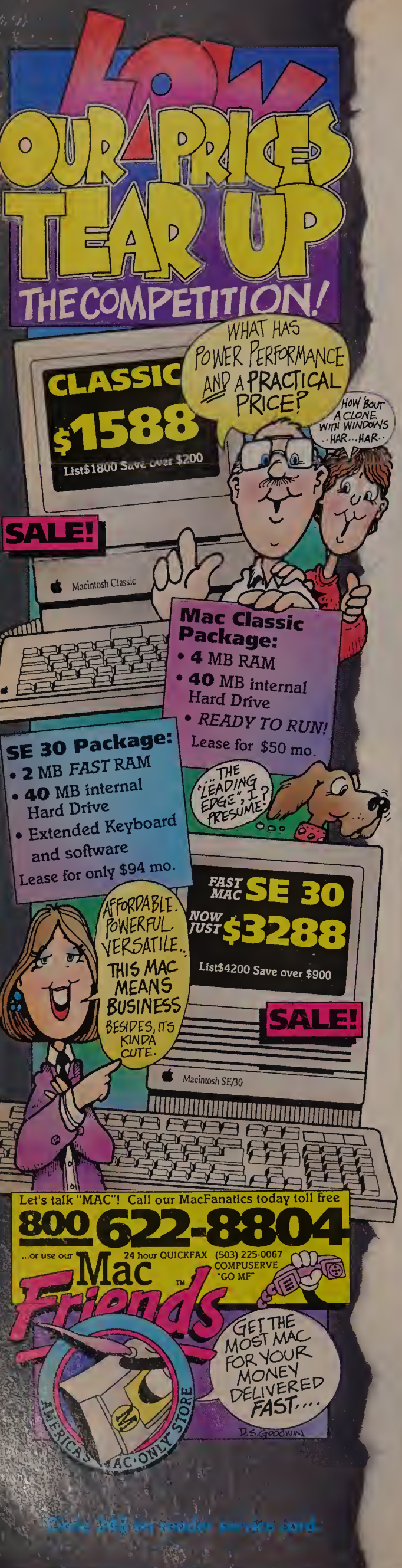

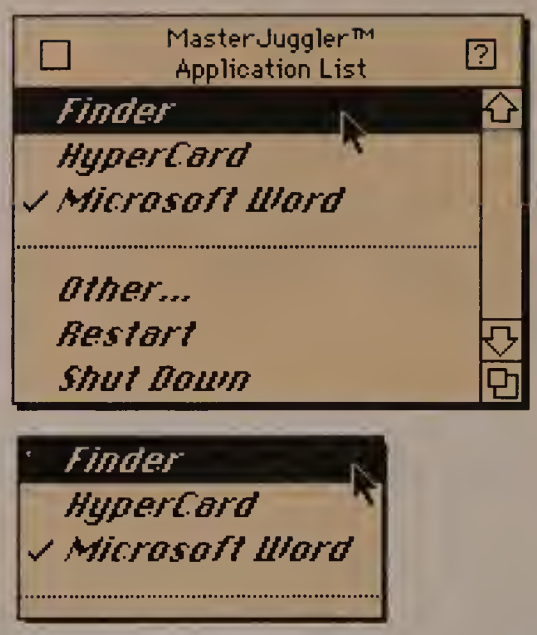

HIDE AND SWITCH To hide windows of inactive programs and see all desktop icons with MultiFinder active, switch programs using MasterJuggler's Application List (top) or its Application pop-up (bottom). Disable Window hiding by pressing ⌘-T in the Application List.

setting the File Type option to Tab-Separated Text. Because the imported information can have a different structure from the FileMaker database, tell FileMaker the relationship you want between the imported fields and the fields in the new database.

Plague

Q Although I frequently scan my hard drive and floppies with SAM Intercept and Virex 2.0, I keep getting a recurring warning that a strain of the WDEF virus has been found on the desktop of my hard drive. I have tried both deleting and repairing this file, as well as scanning my hard drive when starting up with another disk, but every few days the strain reappears.

Andrea Martinez
Diamond Bar, California

A The WDEF virus has been around well over a year but still causes lots of trouble because it spreads so easily from disk to disk. Sometimes merely inserting an infected floppy will infect your hard drive. WDEF infects only the invisible Desktop file, in which the Finder stores icons and other desktop information. It does not infect programs, documents, or system files.

To eradicate WDEF, you must scan and repair all disks that you or anyone else uses with your Mac. The two products you mention, along with several others, can detect and eliminate the WDEF virus and all other known viruses. Disinfectant, by John Norstad of Northwestern University, is my favorite antiviral program because it's fast, thorough, and free. It's available from most user groups and online information services.

You can also remove WDEF (but not other viruses) from a disk simply by rebuilding the Desktop file. To rebuild a hard drive's Desktop file, hold down the ⌘ and Option keys at start-up time. When inserting a floppy disk (or a removable hard disk cartridge), press ⌘-Option until the Mac asks whether you want to rebuild the desktop, and then click OK. If you have multiple drives, keep pressing ⌘-Option until you've instructed the Mac to rebuild each one.

After making repairs, you should install protective software on all your start-up disks to prevent their reinfection by known viruses. Some protectors, such as SAM Intercept, also detect suspicious activity that may be caused by an unknown virus. Most of these reports turn out to be false alarms, so I prefer simple protective software like that included with Disinfectant.

Show Info Report

TIP: Microsoft Excel's Show Info command (Windows menu) displays useful auditing and debugging information in the Info window, but only for one cell at a time. To see the information for multiple cells, select them, choose Show Info, and then choose Print. Whereas the Info window displays only one cell at a time, the printed info covers all selected cells. You can display and print any type of information—cell reference, formula, value, format, protection, names, precedents, dependents—by choosing those items from the Info menu, which appears only when the Info window is active.

Neil Ticktin
Santa Monica, California

Economy Slide Scanning

TIP: You don't always have prints of slides and negatives lying around ready for scanning on a desktop scanner. Yet only a few flatbed scanners have transparency attachments available. Constantly making prints

SCAN LITE You can get decent scans of slides and negatives using ordinary flatbed scanners made for scanning prints. This image was scanned from a medium format (2¼-inch) transparency with an Apple Scanner. A small Letraset light box turned upside down illuminated the slide.

from negatives and shooting halftones from slides can become frustrating. But you can adapt a flatbed gray-scale or color scanner to get good quality scans from slides and negatives. You need an inexpensive mini–light box ($15 to $25 at art supply stores) made for viewing transparencies. Use a better light box for higher-quality scans.

Place the slide or negative on the scanner, and put the light box upside down on top of that. Turn on the light box and scan away. You can invert the scan of a negative to a positive with an image-editing program such as ImageStudio or Photoshop. I have had excellent results using these scans for placement only (not for final film), saving a lot of time and money. "Scan Lite" shows what you can expect.

Howard A. Wright
Grand Rapids, Michigan

When Good Disks Go Bad

TIP: Bad disks make good coasters, but you should try to have them replaced. After I returned four bad disks to Sony (three used, one new), I received a box of 10 disks and a written apology.

Bill Achuff
Philadelphia, Pennsylvania

Secret Bookmark

TIP: Microsoft Word always displays the first page of an existing document when you open it. However, choosing Go Back from the Utilities menu (or pressing ⌘-Option-Z or pressing 0 on the numeric keypad) scrolls to the place where you were working when you last saved the document. If you had text selected (highlighted) when you saved the document, that text will be reselected automatically.

John B. Andreas
Lafayette, California

This trick often fails if you're using two monitors with your Mac and you have moved the document window to the monitor without the menu bar any time before saving the document.—L.P.

File-Recovery Gotchas

TIP: Users of file-recovery programs such as Symantec's SUM II and The Norton Utilities for the Macintosh, and Central Point Software's MacTools Deluxe may be in for a surprise when trying to recover deleted files. You might not be as protected as you think if you use any software that routinely creates and deletes temporary files, such as FileMaker, Microsoft Word, MacWrite II, and many others. In addition, printing on a LaserWriter with the Chooser's Background Printing option causes temporary spool files to be created and deleted. So does using other print spoolers, such as SuperLaserSpool. File-recovery programs track these automatic file deletions as well, leaving less space for storing the files you knowingly delete. Therefore, your list of recoverable files may be filled with "Spool file 1," "FileMaker Temp 4," "Word Temp 13," and the like. To maximize your protection, allocate the largest amount of space your file-recovery program allows for keeping track of deleted files.

Chris Catalano
Farmingville, New York

Larry McHenry, a technical support representative for Central Point Software, points out that tempo-

(continues)

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> Mountains appear more lofty the nearer they are approached, but great men resemble them not in this particular.
> *Lady Marguerite Blessington*

Mountains appear more lofty the nearer they are approached, but great men resemble them not in this particular.
Lady Marguerite Blessington

LASER GRAYS **Shaded text, boxes, and other graphics appear coarse when printed on a 300-dpi laser printer with a standard halftone screen of 60 lpi (top). At 133 lpi, they look smoother and crisper (bottom). You can change the halftone screen in QuarkXPress 2.12 or 3.0 using the Page Setup command.**

rary files actually pack a double-whammy. Not only do they crowd out known files from the list of recoverable files, they may also reuse the disk space formerly occupied by files you have deleted. Even if your file-recovery program recognizes a file by name, you will be unable to recover that file if its contents have been overwritten by a temporary file that was subsequently deleted.

McHenry also notes that recovery of deleted files is further hampered by disk-optimization (defragmentation) software, which eliminates disk space once occupied by now-deleted files. AISoft's DiskExpress II is particularly insidious in this regard. It optimizes the disk continuously in the background, severely lessening your chances of recovering a deleted file.

To work around these problems, put a folder near the Trash to use as a holding bin. When you're ready to delete a file, drag it to the holding bin folder instead of the Trash. When the disk gets full, drag the oldest items from the holding bin to the Trash. Check your holding bin when you need to "recover" a "deleted" file.—L.P.

Enhanced Gray Shades

TIP: When printing from QuarkXPress 3.0 on a laser printer, I found that shades of gray appeared coarse because the standard Halftone Screen setting of the Page Setup command is 60 lpi. Changing it to 133 lpi enhances shaded rules, text, and boxes for laser printing (see "Laser Grays"). Avoid settings of 150 or 200 lpi, however, because they make grays turn black.

Carole Pye
Northbrook, Illinois

A 133-lpi screen frequency will probably cause banding in any gradated fills your document may contain (see *Quick Tips,* January 1991).—L.P.

Simplified Disk Naming

TIP: I conscientiously make archival copies of all original software disks. (It took only one crashed master disk to teach me that lesson!) For two years I have gone through all kinds of contortions to reproduce the weird characters in the names of the original disks for the copies. Then I found that you can copy and paste a whole icon name. You click the icon whose name you want to copy, press ⌘-C (for Copy), click the icon you want to name, and press ⌘-V (for Paste). Voilà!

Michael J. Hull
APO New York

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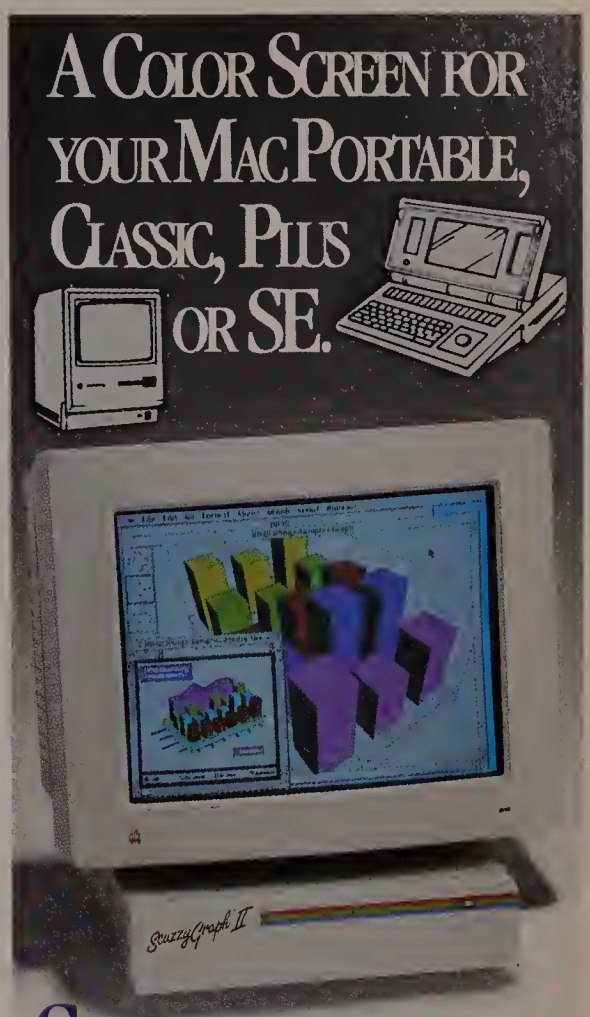
Lon Poole answers readers' questions and selects their tips for this monthly column. You'll find all the best tips from six years of this column in his latest book, Amazing Mac Facts *(Microsoft Press, 1991).*



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Getting Started with Hardware Upgrades

FINDING THE BEST WAY TO KEEP YOUR MAC UP TO SPEED

BY JIM HEID

Buying into the Mac world is like boarding a moving train. You stand alongside the tracks, waiting until the right model comes along, then you time your leap and hold on as money flutters from your pockets. Whew—you made it.

But where are you heading? Is a new model going to pass as you settle into your seat? And if this train can't take you to your destination, will you be able to transfer to one that can?

Every Mac owner has faced worries like these at one time or another—most likely last year, when Apple released four new Macs while discontinuing another four. And Apple's System 7.0 software further complicates matters. Will your upgrade be compatible with all of System 7.0's features? Should you get a new Mac instead?

There are no easy answers, but one thing is certain: an old Mac may not be the fanciest train on the tracks, but it can still take many people where they want to go. More to the point, you can upgrade an old Mac to give it most, if not all, of the features in Apple's current offerings. And if you have one of the newest Macs, hardware upgrades can make a good thing even better. This month, I examine the most common upgrade options available for old and new Macs, to help you map out an upgrade path that makes the most of your Mac and your money.

SCOTT BALDWIN

Upgrade Options

Before devising an upgrade strategy, it helps to know what your options are. Hardware upgrades fall into two broad categories (which often overlap): ones that make your Mac faster and ones that add new features. The most common include the following.

- *Memory* More memory helps programs run faster and enables MultiFinder to run more of them at once. More memory also lets you create larger documents with programs that keep entire documents in memory instead of swapping between memory and disk. Memory prices have plummeted in recent years; at this writing, several mail-order retailers offer 4-megabyte upgrades for a few hundred dollars, and some include an installation video and technical support. A 4MB upgrade consists of four 1MB *Single In-line Memory Modules,* or *SIMMs* —small, plug-in boards, each containing eight memory chips (see "Memory Details" for a list of memory upgrade options and configurations for each Mac).
- *Hard drives* With its vast storage capacity and swiftness, a hard drive is the most important upgrade you can buy. With one, your Mac will start programs and open documents far

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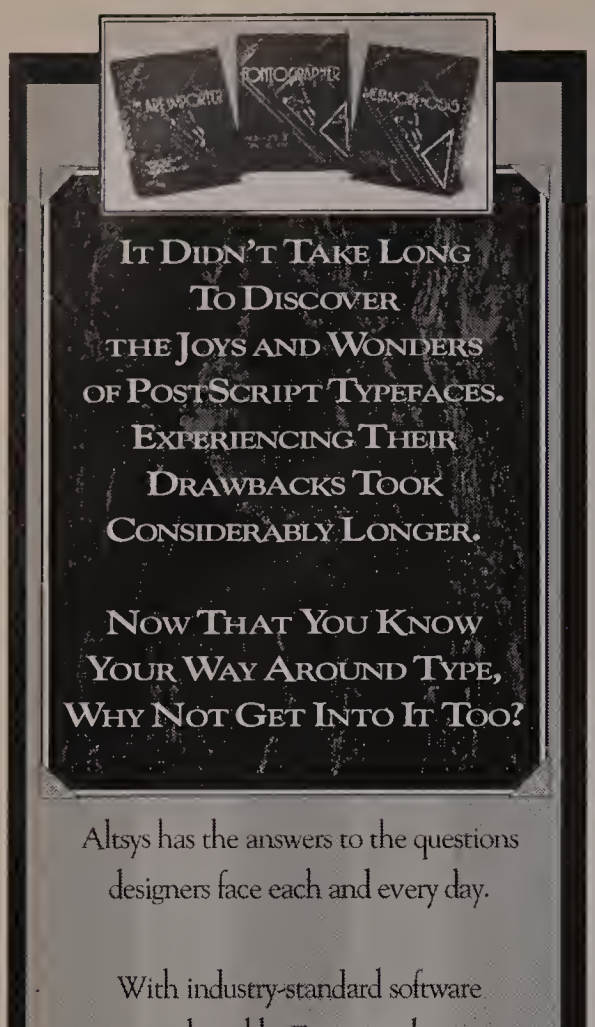

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more quickly, and you'll be able to keep all your files in one place instead of swapping and waiting for slow floppy disks. External hard drives start at under $300.

▪ *Accelerator boards and CPU upgrades* These silicon brain transplants replace the Mac's central processing unit (CPU) with a faster, flashier one. Accelerators for the Mac Plus, SE, and Classic usually replace those machines' 68000 CPU with a 68020 or 68030—the CPUs that drive Apple's Mac LC and II series, respectively. (The original Mac II used a 68020 CPU.) Accelerators for the Mac II family replace the CPU with one that runs at a faster *clock rate,* enabling the Mac to do more in less time. What's the difference between an accelerator and a CPU upgrade? Accelerator boards often include sockets for memory; memory installed there runs faster than memory installed on the Mac's logic board. CPU upgrades simply replace the CPU and thus don't provide the same degree of performance enhancement as accelerators. Costs range from several hundred dollars for an SE or Plus CPU upgrade to several thousand for a II-family accelerator.

▪ *Logic board upgrades* Having an Apple dealer replace your machine's logic board can only step you up to a model that comes in the same basic case—you can upgrade a 128K and a 512K Mac to a Plus; an SE to an SE/30; a IIcx to a IIci; and a II and a IIx to a IIfx. Logic board upgrades generally cost more than accelerators but have a significant advantage: a *ROM upgrade.* All logic board upgrades either include or require the purchase of new read-only memory (ROM) chips, which contain some of the Mac's fundamental system software. When the ROM upgrade is sold separately from the logic board upgrade, the ROM upgrade sometimes also includes a *SuperDrive* floppy disk drive. A SuperDrive, also called an *FDHD* (short for *floppy disk, high density*) can use high-capacity 1.4MB floppy disks in addition to the 800K disks used by most earlier Macs. Thus your Mac not only gets faster, it gets new features as well. The SE-to-SE/30 upgrade, for example, gives you Color QuickDraw, which opens the doors to color video boards. The logic board upgrade will serve you well when System 7.0 is released, too (see "System 7.0 and Upgrades").

▪ *Video boards* A video board's circuitry works with a display monitor to create the Mac's screen image. Most Macs include video circuitry on the logic board but can also accept plug-in video boards that control color or large-screen monitors or add other display talents, such as the ability to attach the Mac to a videocassette recorder (see "Getting Started with Desktop Video" and "Prime-Time Video," *Macworld,* September 1990, and "Mac Video, Take II," February 1991).

▪ *Coprocessors* These specialized microprocessors work along with the Mac's CPU, lightening its load. Math coprocessors speed up calculations in spreadsheets and other number-crunching programs. Math chips are often built in to or offered for accelerator boards, and are available on plug-in expansion boards for the Mac LC and IIsi. (Other Mac IIs and the SE/30 include math chips; the LC can accept one via its expansion slot—several boards bearing math chips have been announced but none have shipped at this writing.) Graphics coprocessors, also called graphics accelerators, are generally used with or included on *true-color,* or 24-bit, video boards. True-color boards enable Macs to display images with photographic realism but must move megabytes of data to do it (see "Fast Color," *Macworld,* January 1991). Without a graphics accelerator, true color can require true patience. Graphics accelerators, currently available for the Mac II series only, aren't cheap, with Apple's Macintosh Display Card 8•24 GC costing $1999.

▪ *Sound-recording hardware* The Mac LC and IIsi contain sound-recording circuitry that, with appropriate software, lets you "attach" recorded comments to documents and send voice-mail messages to other Macs on a network (see "Getting Started with Networks" and "Mac IIsi," *Macworld,* December 1990). You can add sound-recording features to other Macs using external hardware such as Farallon's MacRecorder ($149 to $249, depending on the model) or Articu-

(continues)

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SYSTEM 7.0 AND UPGRADES

Where hardware upgrades and System 7.0 are concerned, you should pay special attention to one area: virtual memory, a feature that lets the Mac treat part of a hard drive as memory. In the past, it was believed that all you would need to use System 7.0's virtual-memory feature would be a Mac containing a 68030 processor or a 68020 combined with a 68851 PMMU (Paged Memory-Management Unit) chip, available from Apple as well as third-party vendors. Not so. System 7.0's virtual-memory software relies on certain ROM routines that aren't present in Pluses or SEs. Thus, the virtual-memory feature works only with Macs designed around the 68030 processor, or with original Mac II's equipped with the optional PMMU chip.

To work around this, many accelerator boards will (or already do) include Connectix Corporation's Virtual utility software, which implements virtual memory with today's system software and which will be updated to be compatible with System 7.0. What does this mean for accelerator shoppers? If you want virtual memory in your 68030-accelerated Plus or SE, be sure a 68030 accelerator includes or is compatible with Virtual before you buy. And if you want virtual memory without having to use a third-party utility, buy an Apple 68030 logic board upgrade or a new machine instead of an accelerator.

late Systems' $129 DesktopMikeVL.

• *Cache memory boards* These special-purpose memory boards boost a Mac II's overall performance 15 to 30 percent by storing the most recently used instructions and data in a small amount of high-speed memory that can be accessed faster than main memory. For a few hundred dollars, you can add a cache memory board to the original Mac II as well as to the IIci, which contains a slot designed specifically for a cache board. Cache memory is built in to the Mac IIfx and many accelerator boards.

What Works for Your Mac?

Some Macs are less receptive to upgrades than others. The Classic, Plus, and earlier machines are especially resistant—with no expansion slots for plug-in boards such as video, accelerator, and high-speed networking boards. To work around this, upgrade developers generally use the Killy Clip, which straddles the processor and thus taps into the signals that would otherwise be provided by an expansion slot.

This clip-on technique works, but it's not without potential problems. One risk is electrical: the Plus and earlier machines lack fans, and their power supplies can be stressed by having to provide juice for extra hardware. The other risk is mechanical: accelerator clips can be jostled loose or develop unreliable connections, especially if you move your machine around. The Classic may be especially prone to this problem: according to several upgrade vendors, the way its processor is soldered to the logic board makes it difficult to develop a clip that stays put.

The IIcx, IIci, IIsi, and LC also contain soldered rather than socketed CPU chips. This has hampered the accelerator board market for these machines, since most accelerator boards require that you remove the original CPU and plug the accelerator board into the CPU socket. The physical design of these machines' CPUs prohibits clip-on alternatives.

The accelerator-and-soldered-CPU issue aside, upgrading a Mac is generally straightforward, since most models provide at least one slot. With the single-slot SE, SE/30, LC, and IIsi, there isn't much room to grow, so you need to choose upgrade options carefully. Fortunately, several SE accelerators accept large-screen video boards via piggyback connectors. And as the LC and IIsi become increasingly

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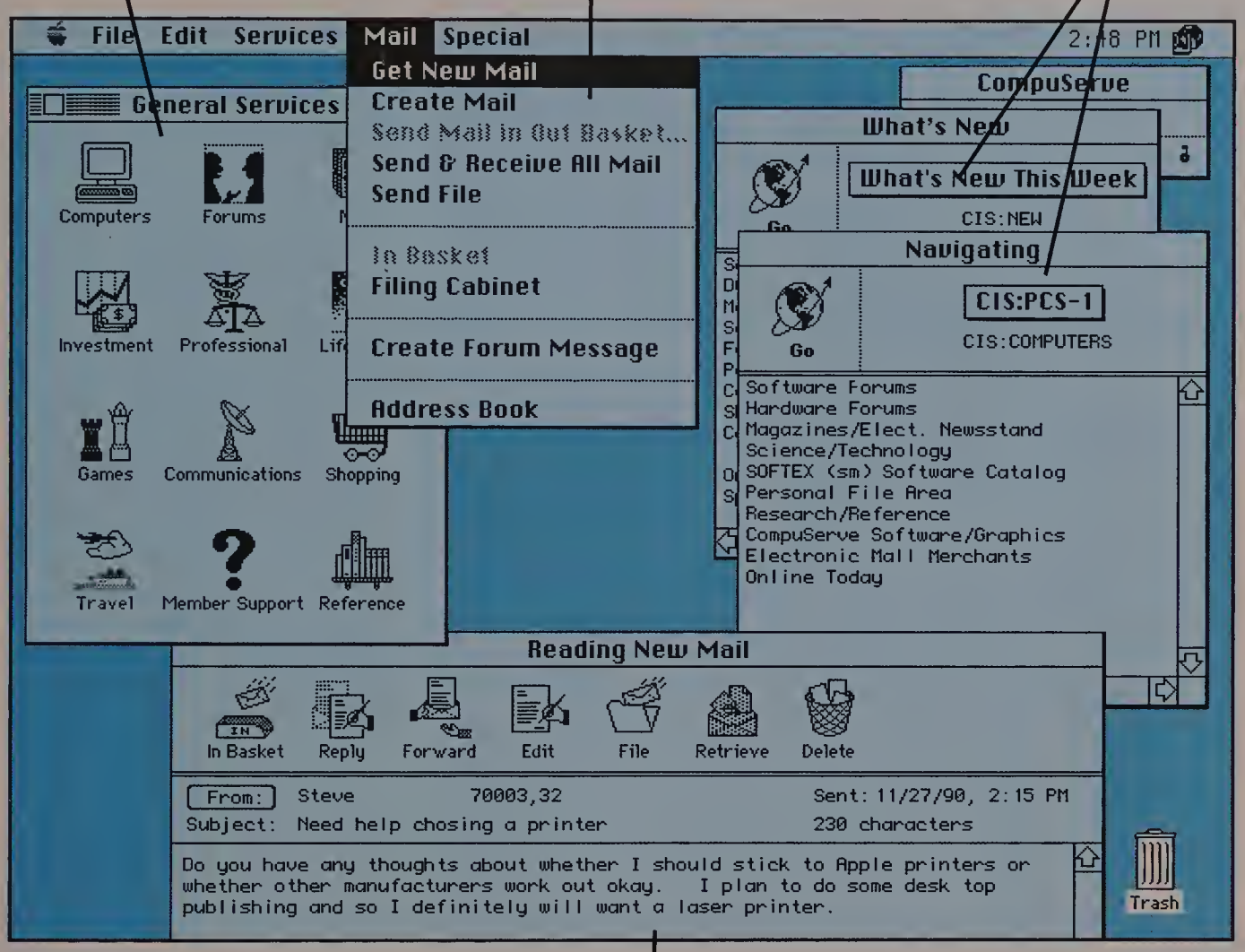

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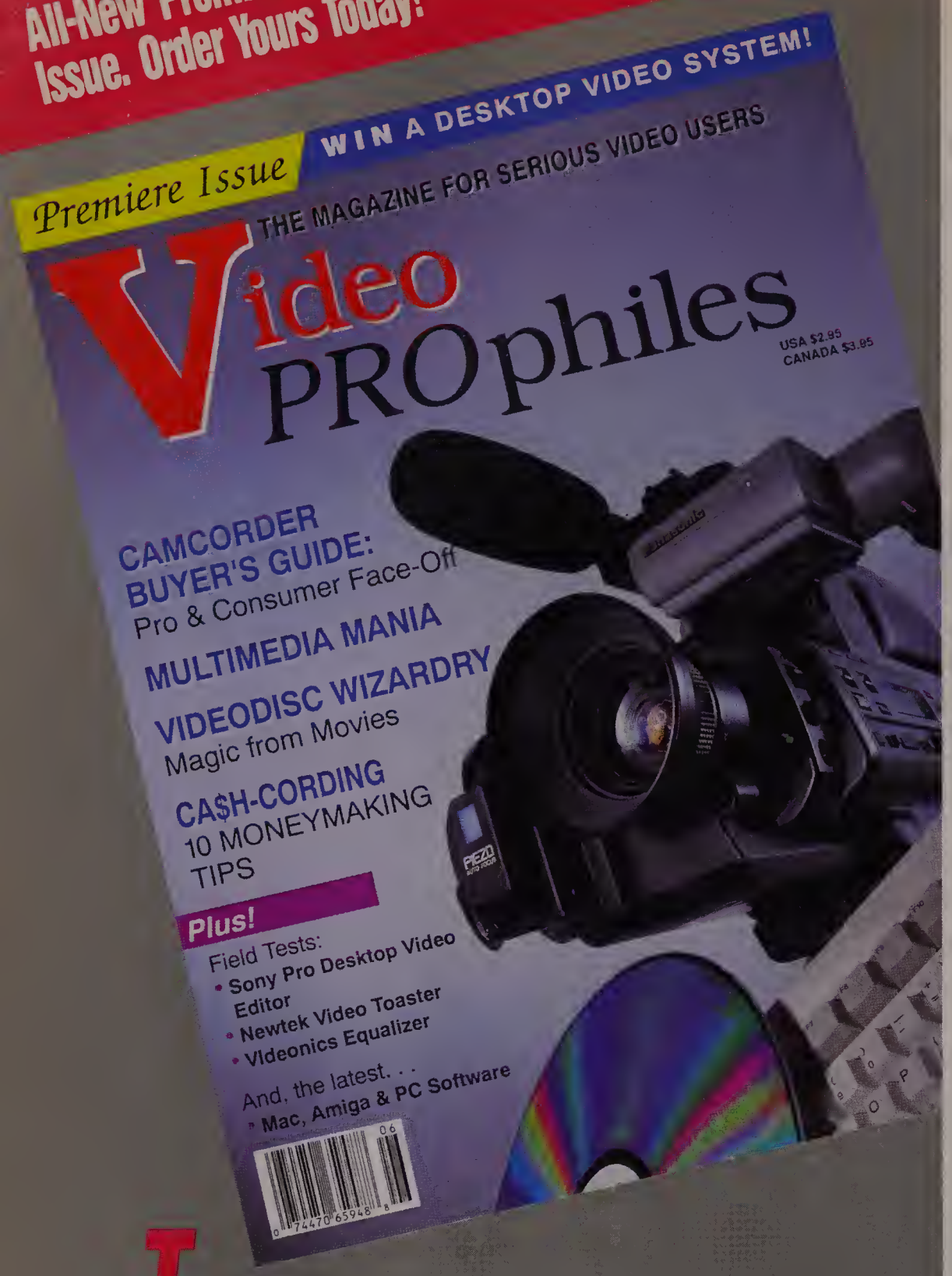

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MEMORY DETAILS

Model	Total Memory	Configuration	Comments
Classic	1MB	logic board memory	150ns or faster chips required
	2MB	as for 1MB plus the Macintosh Classic 1MB Memory Expansion Card with SIMM sockets empty	
	2.5MB	as for 2MB plus two 256K SIMMs	
	4MB	as for 2.5MB plus two 1MB SIMMs	
Plus, SE	1MB	four 256K SIMMs	150ns or faster chips required
	2MB	two 1MB SIMMs	
	2.5MB	two 256K SIMMs plus two 1MB SIMMs	
	4MB	four 1MB SIMMs	
LC	2MB	logic board memory; SIMM bank B empty	100ns or faster chips required
	4MB	as for 2MB plus four 1MB SIMMs in bank B	
II, IIx, IIcx, IIci, SE/30	1MB	four 256K SIMMs in bank A; bank B empty	120ns or faster chips required (80ns for IIci); for best performance from IIci, put larger-capacity SIMMs in bank B
	2MB	as for 1MB plus four 256K SIMMs in bank B	
	4MB	four 1MB SIMMs in bank A; bank B empty	
	5MB	as for 4MB plus four 256K SIMMs in bank B	
	8MB	four 1MB SIMMs in bank A and in bank B	
IIfx	4MB	four 1MB SIMMs in bank A; bank B empty	80ns or faster chips required; special SIMMs required; 1MB minimum SIMM size
	8MB	as for 4MB plus four 1MB SIMMs in bank B	
IIsi	1MB	logic board memory	100ns or faster chips required
	2MB	as for 1MB plus four 256K SIMMs	
	5MB	as for 2MB plus four 1MB SIMMs	
Portable	1MB	logic board memory	100ns or faster, low-power chips required
	2MB	as for 1MB plus 1MB Memory Expansion Kit	

popular, we'll probably see more multifunction boards that cram several upgrades into one slot.

Strategies for Discontinued Macs

We'll look at some specific upgrade strategies, starting with discontinued Macs. See "Where to Buy Upgrades" for a list of upgrade vendors and representative products.

Mac 128K, 512K, and 512KE You can upgrade a 512K Mac to a 512KE by buying Apple's Macintosh Plus Disk Drive Kit, which also includes the 128K Mac Plus ROM chips. But the 512KE lacks the SCSI circuitry needed for fast hard drives, and it lacks sufficient memory to run most of today's programs. For that reason, it's better to buy both the disk drive kit and the Macintosh Plus Logic Board Kit to get a full-fledged Mac Plus. If you have a 128K or 512K Mac, you can also assemble the equivalent of a Plus by using Apple's Mac Plus ROM chips along with third-party SCSI and memory hardware from firms such as Computer Care, Dove Computer, and Newbridge Microsystems. However, now that the Plus has been discontinued, rumor has it the 128K ROM chips and Apple's upgrades may not be available for long. (Some upgrade firms are reporting ROM scarcities now.) Given all this, it may make more sense just to buy a new Mac.

Considering the poor track record of Plus and pre-Plus power supplies, if you do opt for an upgrade, you'll probably want to beef up your power supply using the $80 Power Up kit from Total Systems Integration, which replaces the supply's most failure-prone parts. You can either have a dealer install the kit or send the power-supply board to TSI for installation ($148 including the kit).

Mac Plus If you've outgrown the Plus, your best option is to sell it or supplement it with a new machine. Accelerators and large-screen adapters are available, but the Plus's weak power supply and lack of a fan make these upgrades somewhat risky (note the power-supply comments above).

(continues)

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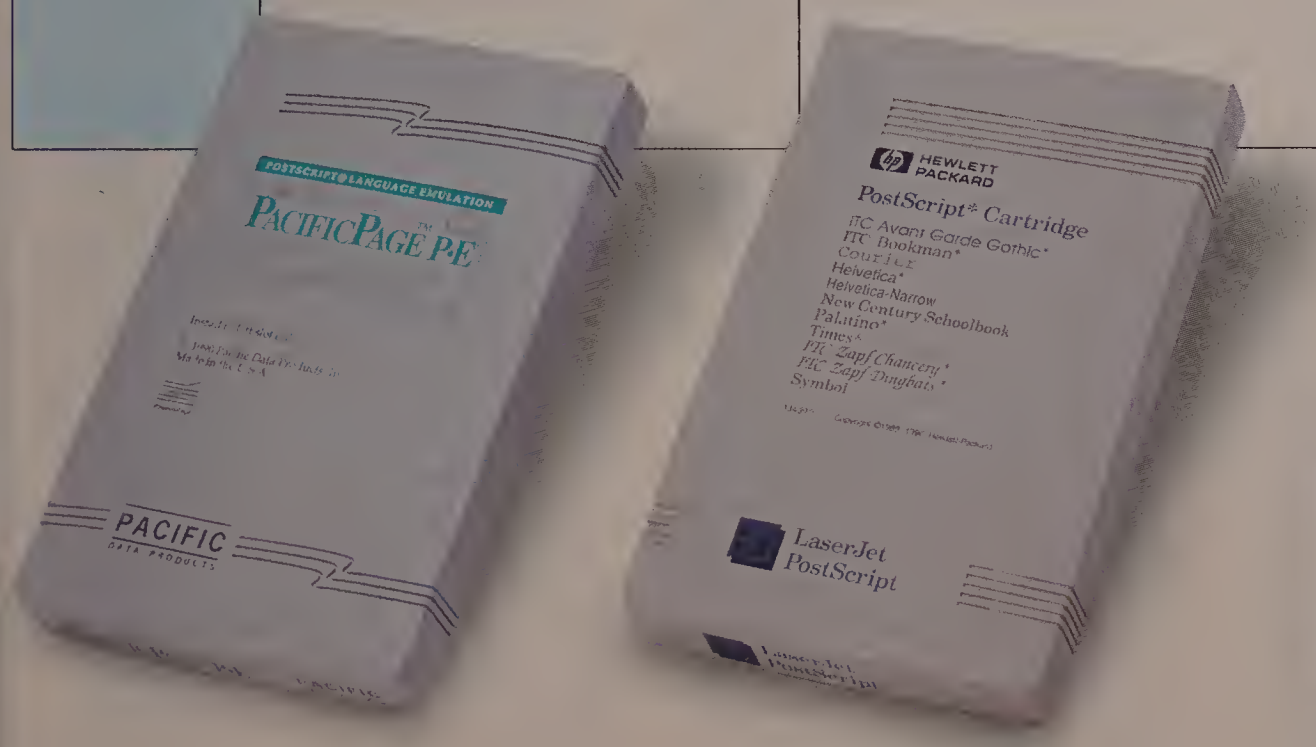

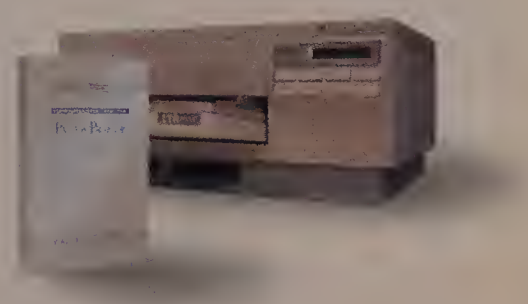

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WHERE TO BUY UPGRADES

Company	Phone	Products
Aox	617/890-4402	DoubleTime-16 accelerator for SE
Apple Computer	408/996-1010	logic board, floppy disk drive upgrades
Aura Systems	619/438-7730	ScuzzyGraph series drives monitors via SCSI
Computer Care	800/950-2273	memory, video upgrades for 128K, 512K, 512KE, Plus, SE, and Classic
Computer System Associates	619/566-3911	FasTrack accelerator for SE
DayStar Digital	404/967-2077, 800/962-2077	accelerators and cache boards for II series
Dove Computer	919/763-7918, 800/622-7627	accelerators and CPU upgrades for most Macs; SCSI and memory upgrades for Mac 128K, 512K, and 512KE
Lapis Technologies	415/748-1600	video upgrades for most Macs, including Classic
Mac Doctor Electronics	415/964-2131	Brainstorm series of memory upgrades for 128K and 512K Macs
Newbridge Microsystems	613/592-5080	accelerators, memory, and CPU upgrades for most Macs, including 128K and 512K; graphics accelerator for II series
Novy Systems	904/427-2358	Mac20MX accelerator for 512KE, Plus, and SE
Orchid Technology	415/683-0300	MacSprint II cache board for original Mac II
PSI Integration	408/559-8544	cache board, 030 slot adapter for IIsi
Radius	408/434-1010	accelerators for Plus and SE; video upgrades for most models
Second Wave	512/343-9661	expansion chassis for most Macs
Siclone Sales & Engineering	408/263-8207, 800/727-8207	accelerators for Mac II, IIx, and SE; memory upgrades for Portable
SuperMac Technology	408/245-2202	SpeedCard accelerator for SE
Total Systems Integration	503/345-7395, 800/874-2288	memory, SCSI upgrades, and accelerators for 128K, 512K, Plus, and SE

Mac SE There's a brighter future for this recently canned Mac, whose expansion slot can reliably accept accelerator boards and large-screen monochrome monitor adapters (sorry, no color). Apple's SE/30 Logic Board Upgrade is even more appealing, providing Color QuickDraw, a more up-to-date expansion slot, and support for virtual memory under System 7.0. Keep in mind, though, that an SE expansion board (such as an accelerator or large-screen video board) won't work in an SE/30's slot.

Mac IIcx This workhorse Mac II can last for years, thanks to three NuBus expansion slots and a large selection of boards to fill them. (The term *NuBus* refers to an industry standard that describes the physical and electrical design of the slots and the boards that go in them.) However, all but the very first IIcx machines contain soldered rather than socketed CPU chips, and as mentioned earlier, that's a problem for accelerator boards. DayStar Digital is the only firm offering IIcx accelerators (PowerCard 030, in 25, 33, 40, and 50MHz versions), and you need to send in your machine's logic board to have a CPU socket installed. (If you can't bear the downtime, some DayStar dealers will swap logic boards for an extra charge.) A better upgrade alternative may be Apple's IIci logic board, which gives you faster performance, a slot for a cache memory card, and new ROM chips that support more than 8MB of memory under System 7.0.

Mac II, IIx With six NuBus slots, these two may have the brightest future of all. Accelerators such as those from DayStar Digital and Siclone Sales & Engineering provide 68030s with clock rates of 33MHz to 50MHz, for speed that rivals the top-of-the-line IIfx. Speaking of which, the Macintosh IIfx Logic Board Upgrade retails for just $2999 plus memory—a deal so good it's created a hot market for used II's and IIx's and helped push down prices for II and IIx accelerator boards.

Strategies for Current Macs

Just because a Mac is still being manufactured doesn't mean there isn't room for improvement.

Mac Classic The Classic's soldered (rather than socketed) CPU chip promises to make life difficult for accelerator developers. Still, several 68030 upgrades for the Classic have been announced at this writing, and others will probably follow. Large-screen video adapters are also available. Given the challenges the Classic presents to CPU clip manufacturers, you might want to make sure the wrinkles have been ironed out before buying a product that clips onto the Classic's CPU.

Mac SE/30 It's a good thing this Mac is reasonably fast, because no accelerator boards are available for the current model. (Dove Computer's MaraThon 030 Accelerator is available for early SE/30s, whose CPUs were socketed.) Large-screen and color video boards are available, however.

Mac LC Several accelerators have been announced for the fledgling LC, as well as Dynamac's $99 LCDevice board, which contains sockets for a 68030 CPU and a 68882 math coprocessor chip. Dove has a similar product on the drawing board. DayStar Digital plans to develop an accelerator, but representatives told me the machine's small power supply presents a considerable design challenge—it supplies only 4 watts to expansion boards, versus 15w in the IIcx. The LC's soldered CPU complicates things too. Video hardware is just beginning to appear for the LC; one noteworthy product is Dynamac's LCDisplay, a liquid-crystal display (LCD) technology similar to that used by many portable computers. PSI Integration's Bus Adapter Card lets you use SE/30 expansion boards and

provides a slot for a cache memory board. Finally, Second Wave's adapter that will let you use one NuBus expansion board with the LC should be available by the time you read this; its price has not been announced.

Mac IIsi Thanks to its unique expansion-slot design, this littlest Mac II can accept either a NuBus board or a board designed for the SE/30's 030 Direct Slot. NuBus compatibility means a huge selection of boards, but some, including Apple's own graphics accelerator, draw more current than the IIsi's power supply can deliver. Determine the power requirements of any NuBus board you plan to buy for the IIsi. DayStar Digital and Dove plan to support the IIsi with accelerator and CPU upgrade boards, but have not announced specifics.

Mac IIci One of the most popular and inexpensive upgrades for this fast Mac is a cache board. Citing reliability problems, Apple yanked its Macintosh IIci Cache Card from the market last year, but there's a large selection of third-party boards. (Apple's should be available again by the time you read this.) Another way to speed up the IIci is to use a NuBus video board instead of the machine's built-in video, whose design can slow down the machine, especially in its 16- and 256-color modes. (This speed-up tip applies to the LC and IIsi too.) No accelerators are available for the IIci.

Mac IIfx Given this machine's blazing speed and exotic design, it's not surprising that no accelerators are available for Apple's top-of-the-line Mac. Memory, storage, and video upgrades abound.

Mac Portable One of the most useful upgrades for the Portable is an external video monitor adapter. Two are currently available: Aura Systems' ScuzzyGraph, which attaches to the Portable's SCSI port and can drive monochrome or color monitors; and Computer Care's Video Mac Pac board, which plugs into the Portable's Processor Direct Slot (PDS) and supports monochrome monitors.

Finally, it's worth noting that Second Wave offers *expansion chassis* for most Mac models. These external boxes contain expansion slots and power supplies. The Plus and Portable chassis let you use SE expansion boards, while the SE/30 and II-family chassis support NuBus boards.

Upgrade or New Machine?

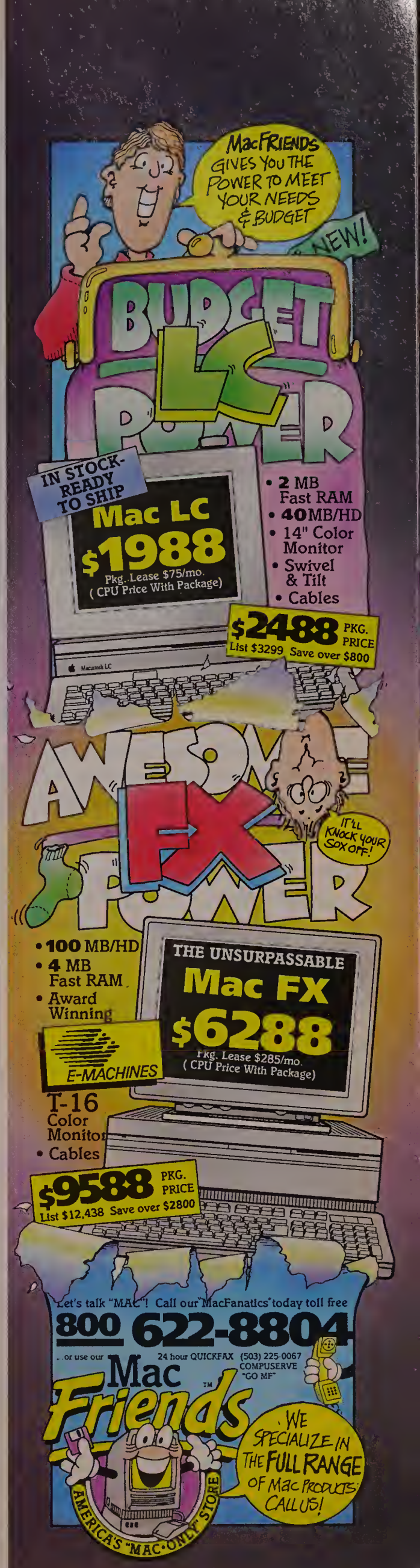
Buying the right upgrade requires pinpointing your Mac's weaknesses. Do programs take too long to start, or documents too long to open? You might need a faster hard drive (or any hard drive, if you don't have one). Once a program starts, does it run sluggishly? Which operations are sluggish? Do calculations take too long? A math coprocessor or an accelerator or logic board upgrade might be in order. Do true-color graphics ooze onto the screen? You might need a graphics accelerator. If you answer "all of the above," think about a new, faster machine.

Last but far from least, it's important to assess your financial options to determine which will cost less: upgrading an existing Mac or selling it and buying a new one. Before last October, upgrading an existing machine usually made better financial sense, since the only alternative was a considerably more expensive new machine. Now that Apple has lowered prices and introduced the more affordable Classic, LC, and IIsi, the decision isn't as easy. Given the cost of hardware upgrades—and the compatibility and reliability risks that sometimes surround them—a new machine may be the smarter buy. That's especially the case if you want to take a big leap forward, from, say, a 1MB SE to a 4MB, 68030-based machine that supports sound recording. And even if a new machine costs slightly more, the extra features it provides may be worth the cost.

There is another plus to buying a new machine: in doing so you get a blank slate that is ready to accept all the upgrade options that will be developed for it. That knowledge will be comforting when the next convoy of new trains starts rolling out of Apple Station. ■

See *Where to Buy* for contact information.

Jim Heid is a contributing editor of Macworld. *His latest book, coauthored with Peter Norton, is* Inside the Apple Macintosh *(Brady, 1989).*



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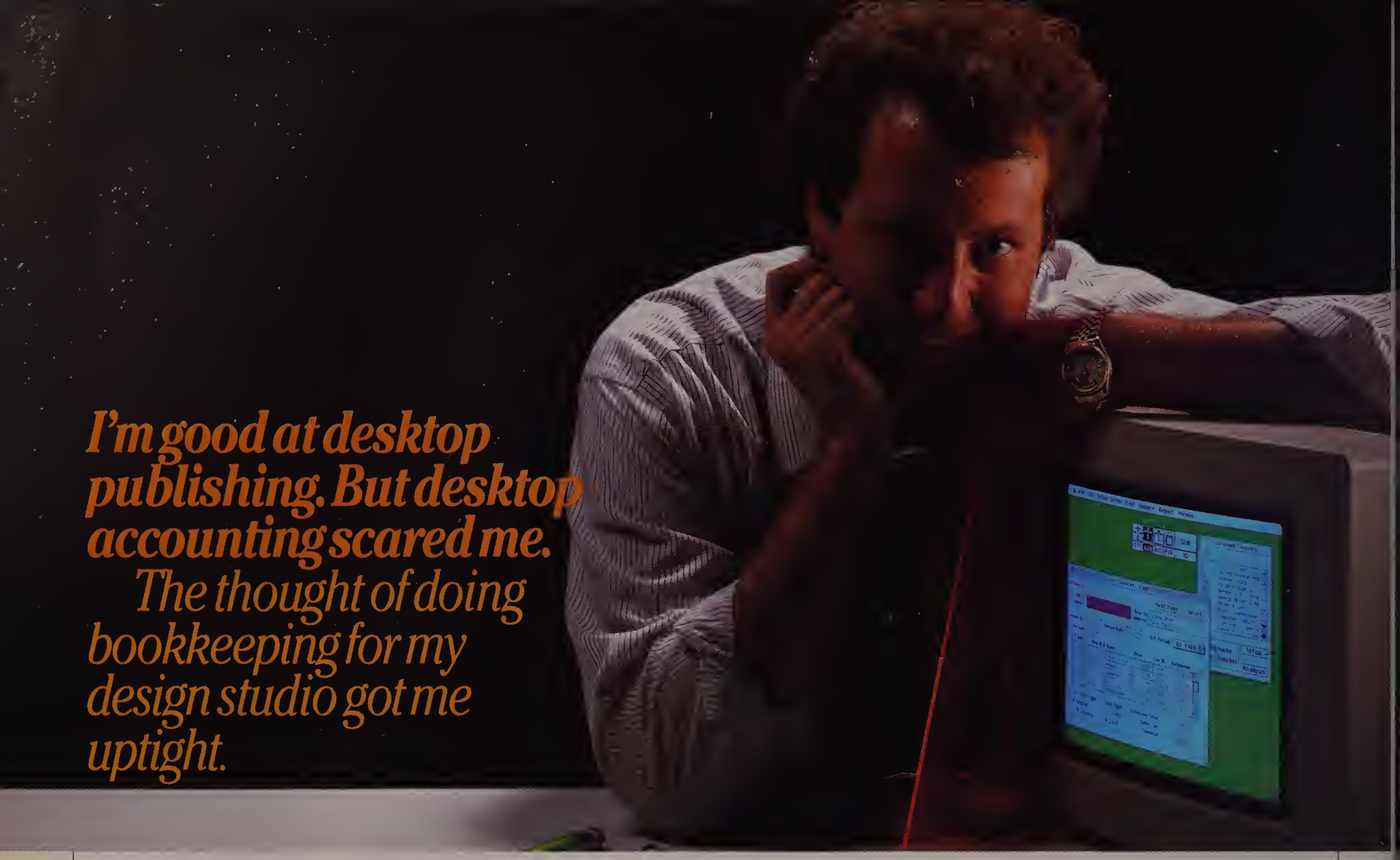


I'm good at desktop publishing. But desktop accounting scared me.

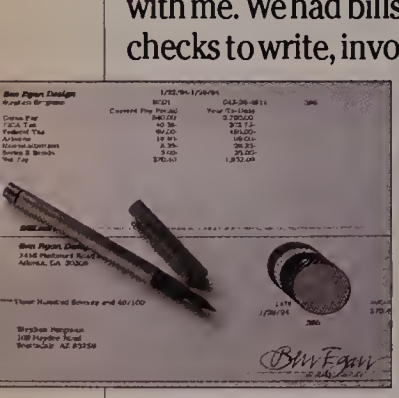
The thought of doing bookkeeping for my design studio got me uptight.

When I heard "balance sheet," I broke into a sweat. I know type, advertising, printing. Now I was forced to do our books.

No choice.

We were on our third part-time bookkeeper in eleven months, and she was called away suddenly. Sound familiar?

But I'm the boss and the buck stops with me. We had bills to pay, payroll checks to write, invoices to send, taxes to set aside.



And deadbeats to collect from–only I had no idea who owed us how much or for how long. Some suppliers may have even thought of *us* as deadbeats. I needed to know our cash flow, and get a handle on all this. But I didn't have a lot of time.

Step one: find an accounting program that feels as familiar as our Macs, that starts out easy, but has lots of reserve firepower for later on.

I found atOnce! The manual looked orderly. I dug in...

The familiar with the unfamiliar

atOnce! starts you off with a tutorial that uses HyperCard, one of my old favorites. I was at home.

Numbers are my nemesis, but the tutorial was actually fun and got me comfortable. It takes you step by step through the program, and gives you some easy-to-swallow accounting basics so you're not reading a foreign language. There's context-sensitive help, just in case.

And while you learn, you can start to set up your books. So it doesn't come in a flash and you sweat a little. But you do it and you learn.

I started off light. Double-clicked on one of the default charts of accounts and my General Ledger was practically set up for me. Then entered a few client names in Accounts Receivable, to get an idea of what was coming in. Prepared six invoices–and atOnce! calculated sales tax. Nice. Printed the invoices which I redesigned in atOnce!–realign a field here, change a font there. The usual.

Then ran a Customer Aging Report to identify the slow-payers (I had no idea such a terrific thing was even possible).

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When our bookkeeper returned, I showed her atOnce! Now she even makes sure my plants are green. Putting the books on the Mac lets me take control.

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Insights on MacInTax

HINTS TO HELP MAKE DOING YOUR TAXES, ALMOST—FUN?

BY CHARLES SEITER

MacInTax is, by most accounts, the most successful special-purpose program yet released for the Macintosh; it's won *Macworld*'s World Class award for best tax planning/preparation or personal finance program for the last four years. Other than speed increases and the accommodation of IRS schedule modifications, the program stays nearly the same from year to year. Nonetheless, power users (MacInTax power users tend to be CPAs who prepare hundreds of returns year-round) keep finding underused and, occasionally, even undocumented features. Here are some tips and hints for getting the most out of MacInTax 1990. I would like to acknowledge help from SoftView (Sue Morgan, Russ Sprouse, and Jeff Felder), writer George Beekman, and tax attorney Rick Seim.

PETER ALSBERG

Mistakes and Missing Fields

MacInTax keeps track of mistakes and missing fields in data entry but recognizes that at 10:30 p.m. on April 14 you may simply need to get a return printed, even if the program thinks you haven't filled out the form properly. Thus the program will print out forms even if they don't meet its rigorous logical standards.

Nonetheless, MacInTax lets you inspect your forms to look for errors and incomplete areas. Hold down the Option key, press Return, and the cursor jumps to the field the program thinks contains a mistake (see "Options for Errors"). The program checks for these errors: (1) sign errors such as a plus or minus sign where the program expects no sign; (2) size errors, where an entry is larger or smaller than the expected range; (3) incomplete entries; (4) entries in IRS-defined blank zones; (5) format errors, in which an entry the IRS expects to be *Y* or *N,* for example, is filled in with a number; and (6) box-checking errors, in which you have checked a set of options that the IRS will find inconsistent.

A Few Hints

Before you reach for the phone to call either SoftView or the eternity-on-hold 800 number provided by the IRS, remember that if you double-click on the text for any line in a form, MacInTax gives you a little window displaying the IRS instructions pertaining to that part of the form (see "Help from Big Brother?").

Besides the IRS's instructions, SoftView includes hints and other advice for preparing returns. Make sure you scroll all the way down the pop-up instruction box until you get to the heading Tax Hints—some of this advice can save you serious money.

Saying No to Corruption

On occasion files become corrupted. This may show up when you try to save the file—the system typically gives you the message "THIS FILE USES FORMS THAT ARE NOT AVAILABLE" and returns you to the Finder. In the Finder you can see the right form, but the last modification date doesn't correctly show the last time you worked on the file. The recommended safety precaution is to lock all your forms using Get Info from the desktop. This way, if you find your system crashing often, you won't have to do anything other than restart, and although the data you were entering at the time of the crash may be lost, your original files will be preserved.

Instant Access

When you click on a line in Form 1040, the Edit menu shows the instructions, itemizations, or worksheets currently linked to that line, and you can select one of these documents and open it directly. This is a good way to navi-

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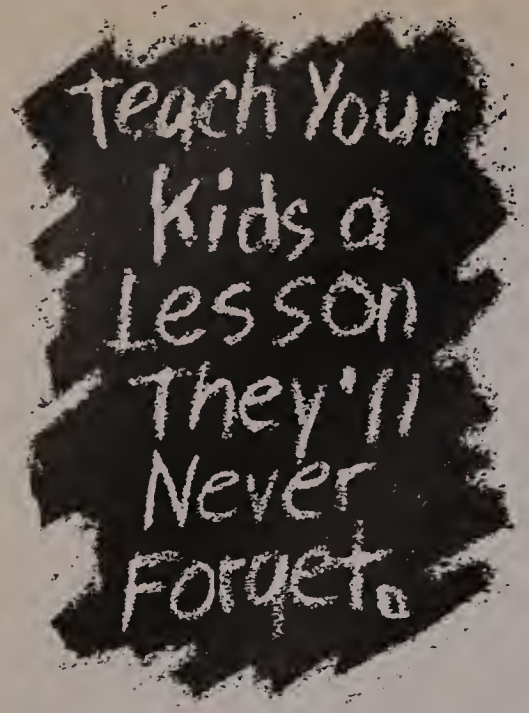
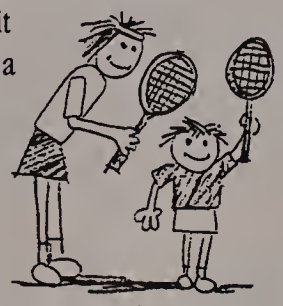
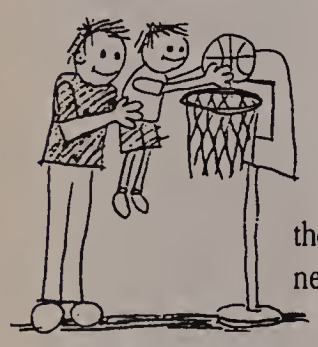


With all the benefits of fitness — stronger heart and lungs, reduced stress, increased energy — isn't it time you started a regular exercise program with your children? The good fitness habits they develop now could give them a healthier, happier lifetime — a gift they'll appreciate long after their toys and games are gone. Just find those physical fitness activities you all enjoy and exercise at least three times each week. For yourself and those you love, start today. Make fitness a family affair.





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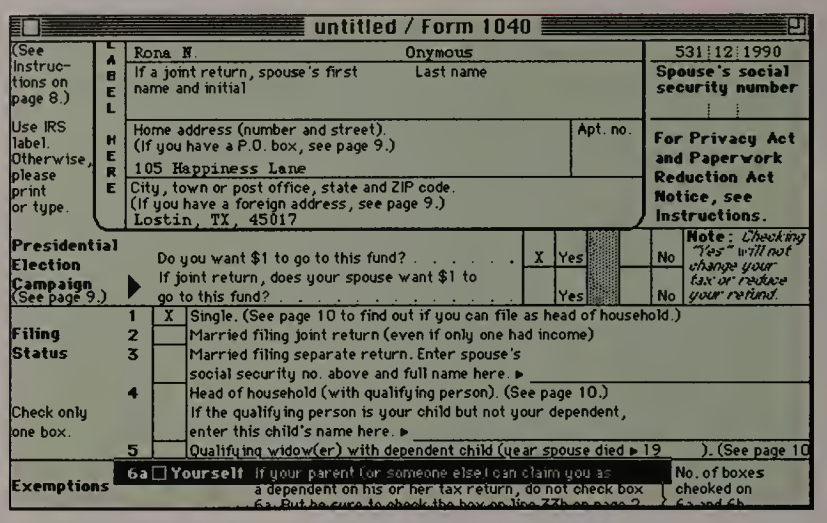

OPTIONS FOR ERRORS When you press Option-Return, MacInTax jumps to the next erroneous or the next unfilled field. You can use this feature as an aid in filling out the forms for the first time, or for checking your work before printing.

gate the program, since the Edit menu shows explicitly what the program recognizes as being linked to a particular line. Or you can navigate by selecting a field and then using ⌘-H for help, ⌘-W for worksheet, and ⌘-I for itemizations.

The other navigation tool that requires a bit of explanation is the Open Forms command under the File menu. This command displays a list of all the forms, schedules, worksheets, statements, and itemizations that have been opened for the current tax return. Incomplete forms are conspicuously labeled "Not Done" and provide a snapshot of the return's status (see "A Command of Form").

To work on Schedule A, for example, highlight Schedule A and click on the OK button, or simply double-click on Schedule A. If you want to open multiple forms, hold down the Shift key and select the forms you want, and then click on the OK button to open them.

Putting Worksheets to Work

Often MacInTax users plunge in and begin filling in forms and schedules directly. For simple returns this doesn't cause any problems, but in general it's better to enter data at the worksheet level and let the program fill in the schedules from worksheet data.

Remember that if you enter an amount manually on a line in a form, you can't get a worksheet to calculate that amount. You must first delete the manually entered amount and then double-click on the line. And also please note: a zero entry qualifies as an amount (see "Zero Isn't Nothing").

Worksheets also provide a way to override automatic calculations performed by the program. For example, to adjust earned income calculated by the program, you can open the Schedule SE Adjustments worksheet and enter an adjustment on the indicated line. This forces the program to accept your entered amount rather than its own calculation. You can access worksheets (for example, the Schedule SE worksheet) in two ways: by simply selecting it from the Worksheets menu, or by opening the Short or Long Schedule SE from the Schedules menu and double-clicking on either line 1 or 2.

If you have K-1 activity, be sure to use the K-1 worksheet located on the

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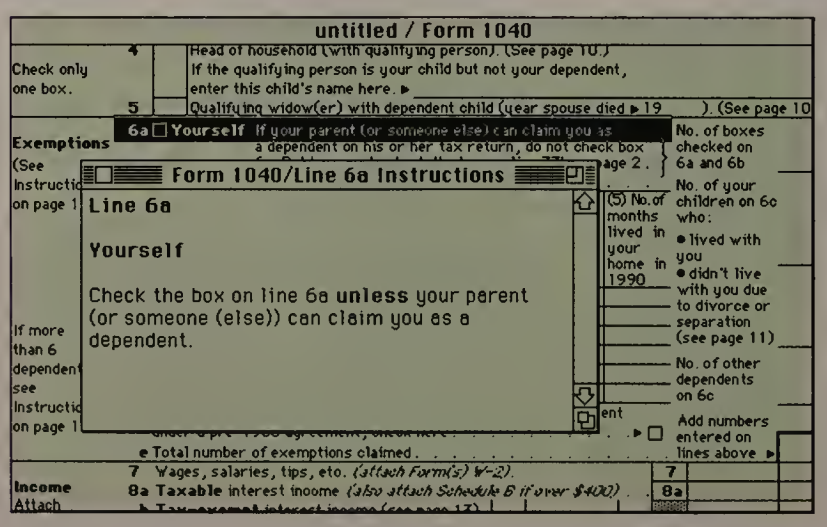

HELP FROM BIG BROTHER? Double-clicking on the title line for a field brings up a pop-up help window that gives you the official IRS advice on filling in the field.

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■ State the precise specifications of the merchandise, such as model, make, size, component parts, etc.
■ Confirm the price and expected delivery date as advertised.
■ State on your order whether you will accept substitute merchandise if the item you specified is unavailable. If you won't accept a substitute, state that your payment should be returned.
■ Record of payment is essential if a problem arises, so do not send cash.
■ Keep copies of your order and all associated correspondence. Your records should include the company's name, address, and phone number; a description of the merchandise; your canceled check or money-order carbon; the date you mailed the order; and any sales slips and shipping receipts.
■ Do not insure your order. It is the Seller's responsibility to make sure you receive your merchandise.

By phone:

■ Note the name of the person who takes your order, and the time and date of your conversation.
■ Make a record of your order, the price, promised availability, and the expected components.
■ Save all correspondence, including your canceled check or money-order carbon and any written confirmation sent by the Seller.

Questions to ask:

■ Does the advertised merchandise include all necessary parts and accessories? Are they made by the same manufacturer? Is the version number or model number the same? Is the product compatible with the hardware/software you intend to use it with?
■ Can your order be shipped immediately? If not, when will it be available for shipping?
■ Has the advertised price increased?
■ What warranties does the merchandise carry? Who provides the service?
■ What is the Seller's return policy? Exchange or repair? The refund policy?
■ If a problem arises, with whom should you correspond?

PROBLEMS? SOLUTIONS:

1. If you do not receive your order as promised or if the merchandise is defective, write to the Seller immediately. Include a description of your order, the price, date, and account number or order number if available. Keep a copy of your letter.
2. If you register your complaint by phone, send a follow-up letter to confirm and keep a copy of it.
3. If you think the merchandise is defective, review your product instructions and warranty carefully. Make sure you expect only those features and abilities that the product is supposed to have. Then contact the Seller for procedures. Do not return the merchandise until you have been instructed to do so.
4. If you return the merchandise, keep the shipper's receipt or packing slip. Your right to reimbursement of postal costs is determined by store policy.
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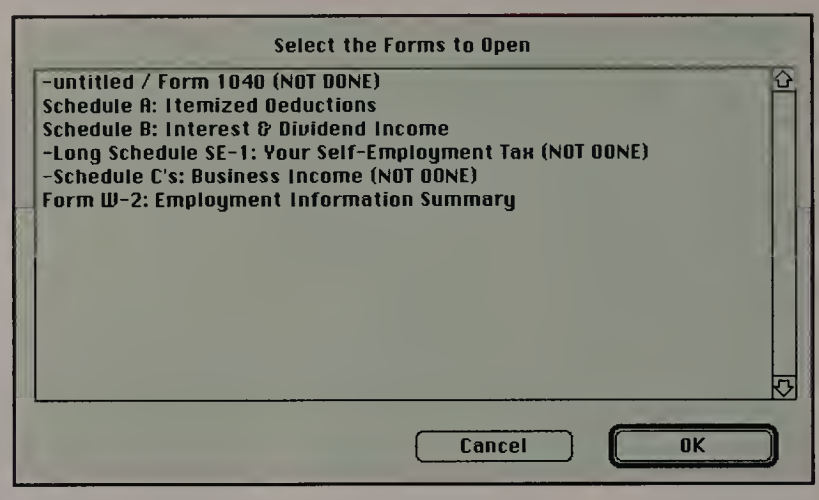


A COMMAND OF FORM The Open Forms command under the Edit menu is particularly useful for preparing complex returns, since it shows the status of the documents you have linked to a 1040 form (flagging unfinished forms as Not Done).

Worksheets menu. This worksheet is similar in design to the actual Schedule K-1 the IRS publishes. MacInTax automatically carries forward the many variations of the K-1–type income and deductions to the proper form and schedule (this is tiresome, verging on impossible, to do manually with paper forms) and provides an audit trail that backs up the information filed with your return.

Following this recommended worksheet-oriented style, enter your tax payments on the Tax Payments worksheet. If you have federal and/or state withholding, and you complete the W-2 summary worksheet, the Tax Payments worksheet is automatically opened for you. The total of your state payments made in the current tax year automatically carries over to Schedule A and also to the state return. The program uses the dates of your tax payments, if applicable, to compute the information necessary for Form 2210, Underpayment of Estimated Tax.

Discarding Linked Items

If you can't discard a form or worksheet, it means that you have something linked to it. This may be another form, schedule, worksheet, or statement, or it may be an itemization. Discard the linked item or items first, and then the program lets you discard the original item. If you aren't sure what documents you have opened, use the Open Forms command to view a complete list of all documents, then delete them manually.

A Form with Two Views

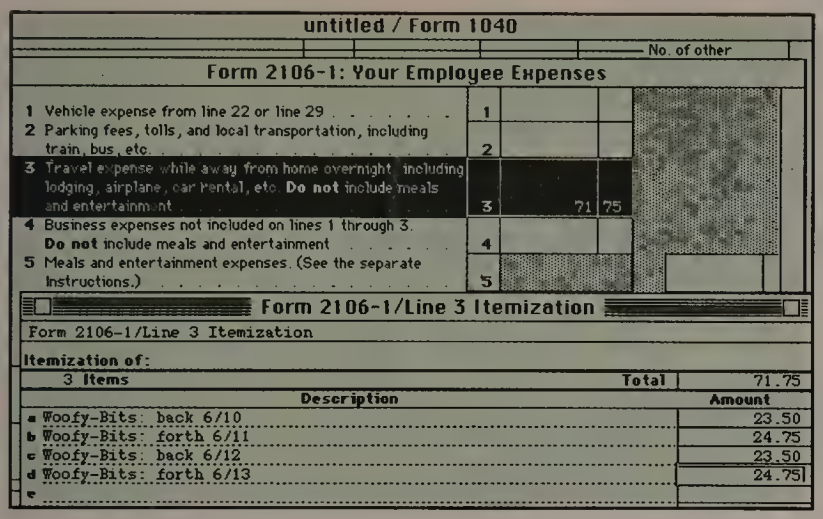
Since IRS forms are pretty long compared to the dimensions of a compact Mac screen, you may want to see one part of a form while you are working on another part of the same form. MacInTax allows you to open the same form twice, placing it in two independently scrollable windows. After opening a form from the menu, hold down the Option key and select the same form again. This opens the form in another window, and you can then independently resize and position the two windows on screen for simultaneous viewing. This doesn't create another copy of the form, just another view of the same form.

Finely Tuned Fonts

The fonts shipped with MacInTax are individually fine-tuned for each font size to make the text fit properly in crowded forms. Be sure to install all the fonts and sizes recommended for this year's product for the printers you intend to use with MacInTax (Adobe Type Manager doesn't fix this situation).

Looking Forward

The advantage of using a sophisticated tax-preparation program is actually twofold: you make it easier to prepare this year's return, and you also make it easier to plan ahead. With MacInTax, throughout the year you can plan for filing your taxes by entering the current year's data in last year's forms. Specifically, you can put each individual piece of data (that is, each *transaction*) into an itemization, adding to the file periodically. If all your income appears as a single lump on a W-2 with proper withholding, this is not so critical, but if you are self-employed with several variable sources of income and lots of deductions, it's a practice that lets you estimate your total tax liability at any point in time. Furthermore, by the end of the year your taxes are almost complete. You can use the Converter on the Utility



HOT ITEMS Itemizations are a great MacInTax strength—they let you keep running totals through the year, and they provide valuable evidence for audits. Itemization worksheets pop up when you double-click on fields in the appropriate forms.

disk to move the accumulated data into the new year's forms.

The program provides two options for converting this data: (1) to bring forward the prior year's tax information that would be applicable to this year's forms, or (2) to transfer *all* data from last year's forms to this year's. You want this second choice if you have been storing all the transactions in itemization lists.

First Items of Business

MacInTax support staff and power users all emphasize the advantages of using the program's itemization capabilities. By using itemizations, you document entries and provide a clear audit trail showing the source of each entry.

Here's an itemization example. Suppose you are a professional actor and want to itemize, on line 2 of Form 2106, your transportation expenses to and from the set of the Woofy-Bits Dog Food commercial. You select Form 2106 from the Forms menu and double-click in the data entry area of line 3 (see "Hot Items"). A blank itemization for that expense then appears. You can also open the itemization for that line by highlighting the line, and then selecting Itemize Line 3 from the Edit menu or pressing ⌘-1.

Now you can enter your transportation expenses into the itemization as shown in "Hot Items." As you enter data, MacInTax automatically totals the expenses and keeps track of the number of items you've entered. MacInTax then posts the total back into Form 2106 on the appropriate line. If you need to include additional transportation expenses to the total at a later time (perhaps you get called back for a cat food follow-on), simply open the itemization again and add the new information. The amounts are automatically updated. This proves valuable as a memory aid not only if you are audited but also when you prepare next year's taxes.

By using *nested* itemizations, you can create itemizations for individual amounts within the main itemization, for more complete and accurate documentation. To create a nested itemization, open an itemization window for the expense involved. For example, suppose you have entered data on lines a through d of a base itemiza-

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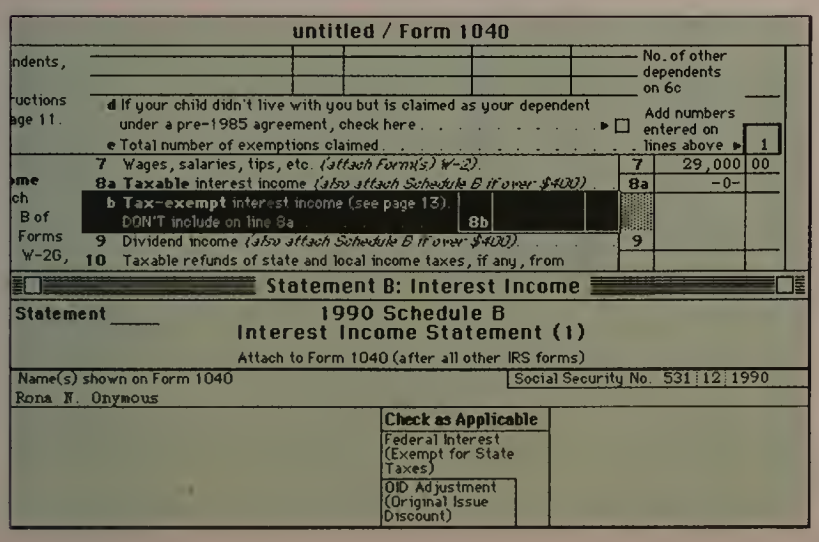

ZERO ISN'T NOTHING Double-clicking on a blank field gets you the worksheet for calculating the field entry. If the field shows a zero, the program sees that as a value and won't help you. When possible, calculate at the worksheet level.

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tion. On line e, double-click in the data entry area to open a nested itemization, and continue entering data. These subitemizations are linked to the selected line, in this example line e. Note that you can select nested itemizations from any line in the itemization window. You can continue nesting itemizations this way as deeply as computer memory allows.

Adding It Up

MacInTax itemizations won't do every type of arithmetic you might like. For example, if you want to keep separate categories of business expenses for subtotals, you will find itemization awkward. A helpful workaround is simply to run a spreadsheet along with MacInTax under MultiFinder. This gives you a workspace for separate subtotals (keep the spreadsheet file in your MacInTax folder); you can just cut and paste the subtotals into itemization fields.

Identifiable Links

There's one more neat itemization trick: you can unlink an itemization and relink it somewhere else. This helps if, for example, you complete a worksheet and wish to discard it but want to keep one of the entries you itemized for use somewhere else in your return. All the information entered in itemization sheets is thus available for reference.

When you unlink an itemization and relink it elsewhere, MacInTax doesn't always update the description of the document in the new link, and MacInTax's brief descriptions are fairly cryptic. So write a short line somewhere to remind yourself where the new link is supposed to lead.

Sharing the Wealth

If you've found a tip or shortcut not mentioned here, spread the word to other *Macworld* readers by sending it to *Quick Tips, Macworld,* 501 Second St., San Francisco, CA 94107. Ⓜ

See *Where to Buy* for contact information.

Charles Seiter is both a descendant and sibling of tax attorneys and a frequent reviewer of tax products for the Mac and other computers.

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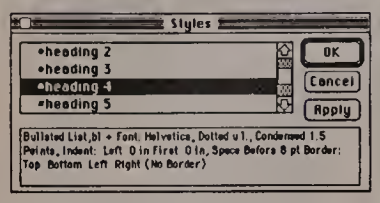

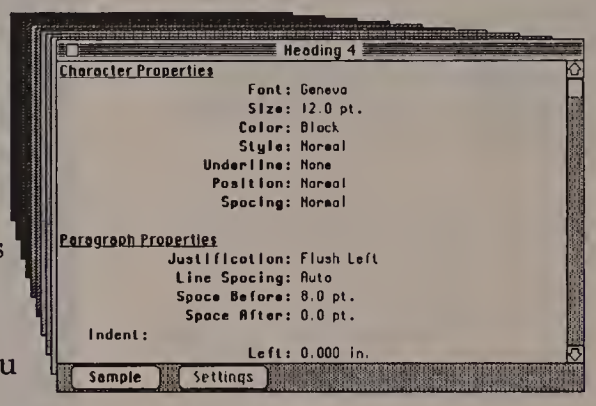

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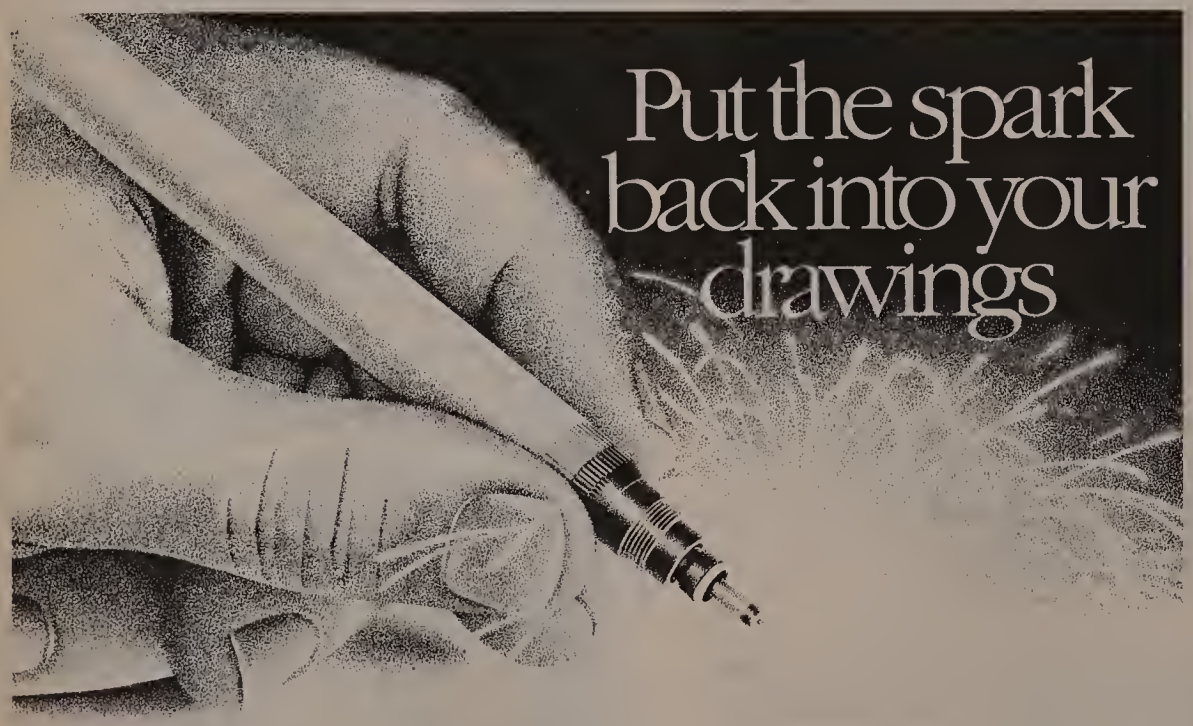

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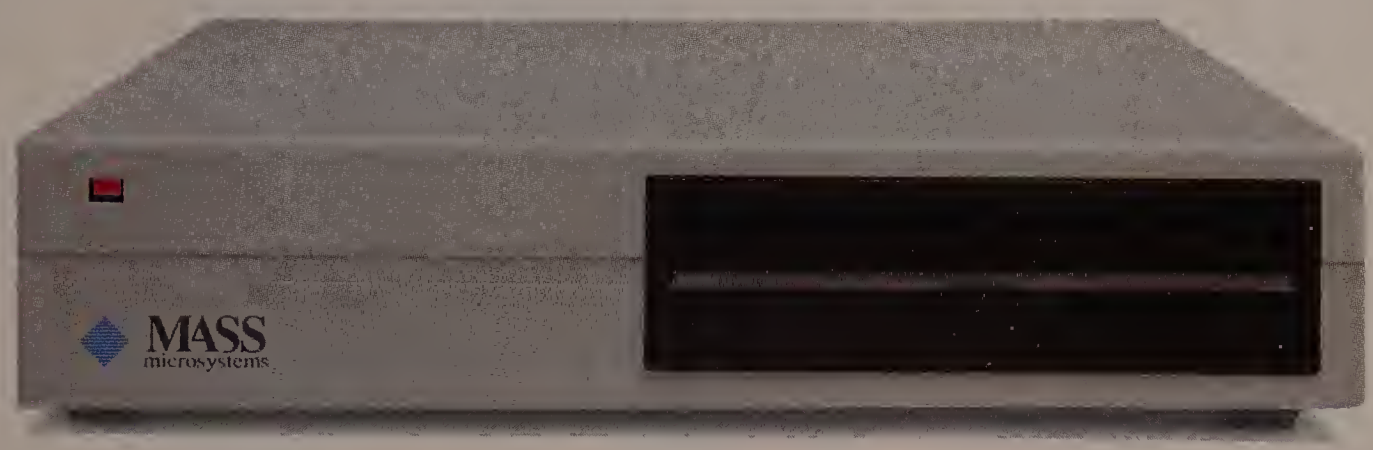

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Nothing beats an original. DataPak was the first removable hard disk cartridge drive for the Macintosh. And it's still the best.

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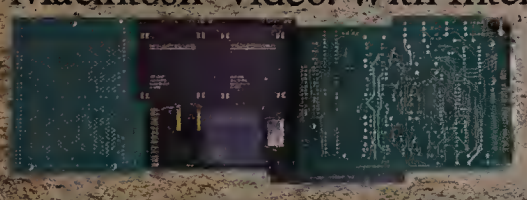
VIDEO EXPLORER™

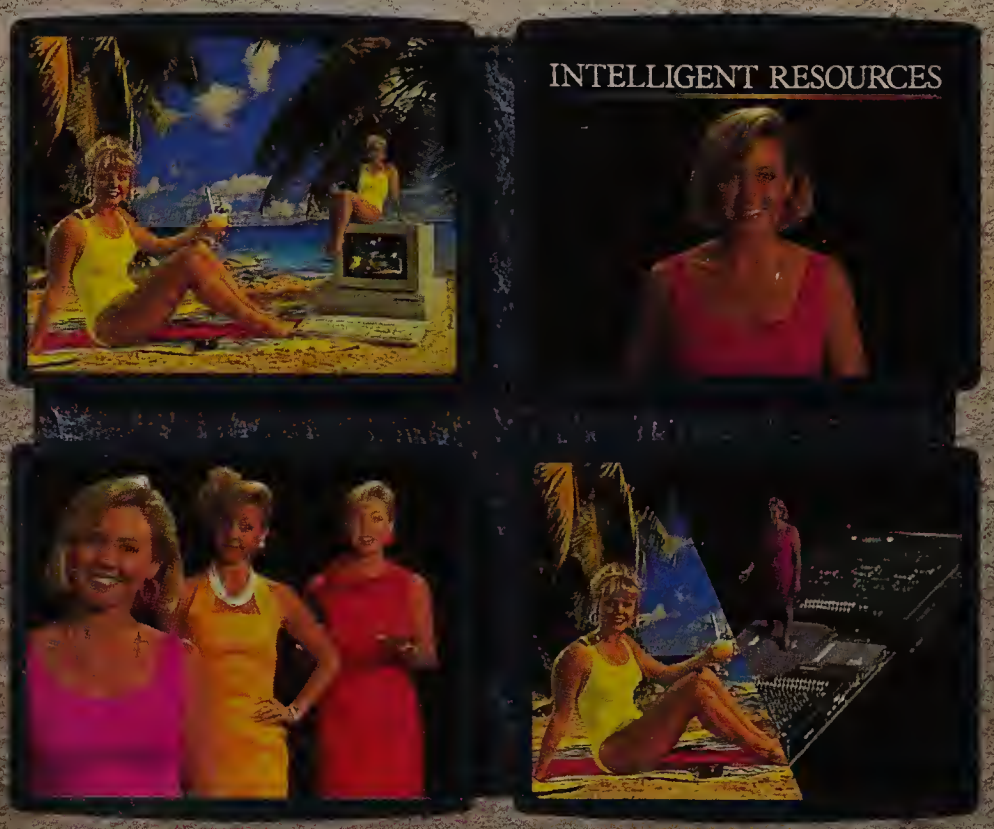
Broadcast-quality video is finally coming to the Macintosh.

Forget everything you've heard about Macintosh® video. With Intelligent Resources' Video Explorer, video will never be the same!



Takes up just one NuBus™ slot in your Macintosh.

We've invented a totally new kind of video card for the Macintosh, with incredible real-time video processing capabilities. The Video Explorer is a multi-synchronous card that supports all major broadcast video and computer graphic timing standards. On it you'll find a state-of-the-art custom chip set; one of the largest and most powerful ever produced for personal computers.



Luminance and chrominance keys

Multiple inputs

Anti-aliased titles and graphics

Real-time effects

Since the Video Explorer is a programmable 32-bit digital video engine, there's almost no end to the broadcast-quality effects you'll be able to achieve. You'll have full control of video processing: frame by frame, line by line, and pixel by pixel. You'll be able to perform fades, wipes, dissolves, and digital video effects.

You can key on chrominance and luminance signals, combine multiple live video signals, and even overlay anti-aliased titles and graphics on live video.

The Video Explorer can simultaneously manipulate video signals from a variety of sources, both live and computer generated. By genlocking to a common sync signal, a Video Explorer can accept video from an external source as well as from internal sources cascaded through our digital video bus. This downstream capability allows linking of video bus–compatible cards for even more sophisticated special effects.

Soon, the power of this new video technology will be unleashed. Join us as the serious fun begins! Intelligent Resources, 1626 Colonial Parkway, Inverness, Illinois 60067. Phone (708) 705-9388 or Fax (708) 705-9410.

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UPDATES

Here's our list of some of the latest versions of Mac software that were announced at the time we went to press. We hope you'll find it useful. The first price is the upgrade cost for registered owners; the second price is the current list price. (Send your update announcements to Updates, Macworld, *501 Second St., San Francisco, CA 94107.)*

AutoSave II version 1.1 is user configurable, with a Save option that can be set for time periods of from 1 to 99 minutes and lets you use automatic saves for up to 50 programs. Also includes an Ask Before Saving feature that allows you to temporarily disable the auto-save feature on a per-document basis. Magic Software, 402/291-0670 or 800/342-6243. Contact vendor for update cost; $49.95 new.

BackFax version 1.5 adds the option to have Send and Receive automatically turn on at the time you start the computer. Also enables user to create a complex fax from several different programs. Solutions, 802/658-5506. Contact dealer for update policy.

ScriptEdit version 2.0 lets you edit HyperCard scripts while the program is active. Has five Clipboards that can each store up to 32,000 lines of text; has a menu that displays all handlers or functions in the current script; and includes GREP searching, which allows user to search for script text based on a description of the text. Somak Software, 619/942-2566. $25; $99 new.

Virex version 2.84 combats three additional Mac strains of the ZUC and nVIR viruses. HJC Software, 919/490-1277. $15; $99.95 new.

PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
1st Aid Kit ★	2.8	512KE/3.0		*
4th Dimension	2.1	1MB/6.0.2		Free
Aatrix CheckWriter II ★	2.01	512K/4.1		$10
Aatrix TimeCard	2.0	512K/4.2		Free
Accountant Inc., Professional	1.0.4	1MB/6.0.3	9/90	$19.95
ACCPAC Bedford Simply Accounting	1.1	1MB/5.1		$50
AccuText	2.0	4MB/6.0.2		*
Address Book	2.0	1MB/6.0.2	6/90	$25
Adobe Illustrator	3.0	2MB/6.0.3	2/91	*
Adobe Type Manager ★	2.0	1MB/6.0.2		Free
AdWriter	2.0	1MB/6.0		Free
After Dark	2.0	512KE/4.1	7/90	*
AgfaType	2.0	2MB/6.0.2		Free
Alchemy	1.1	1MB/6.0	10/90	$25
Aldus FreeHand	2.02	1MB/6.0.3		*
Aldus PageMaker	4.0	1MB/4.1	9/90	$150
Aldus Persuasion	2.0	1MB/6.0		*
AmPack Plus ★	4.2.2	512K/3.2		$29.95
Analog Connection WorkBench	3.0	1MB/5.0	5/90	$50
AntiToxin	1.3	1MB/6.0.2		$15
Aperture	1.7	2MB/6.0.3	7/90	*
AppleShare File Server	2.0	512K/3.2		*
ArchiText	2.0	1MB/6.0.2		Free
Aristotle's Politics	2.0	2MB/6.0.3		Free
The Art Importer	2.0	1MB/6.0	5/90	$20
ArtRoom	3.0	512K/3.2		$199
AutoCalc	2.0	1MB/6.0		$95
AutoSave II	1.1	512KE/4.2	7/90	$7.50
A/UX	2.0	4MB/6.0.5		*
BackFax ★	1.5	1MB/6.0.3		Free
Back to Basics: Professional	2.0	512K/3.2		$75
Bitstream Typeface Library	2.0	1MB/6.0		*
Blueprint	2.0	1MB/6.0		*
Bomber	2.0	1MB/6.0		*
Bridge	6.0	512K/3.2		$17
Business FileVision ★	1.5	1MB/6.0.2		*
Business Sense ★	1.2	1MB/6.0		*
Business Session ★	3.2	512K/3.2		Free
CA-Cricket Presents	2.0.1	1MB/6.0		*
Calculator Construction Set ★	2.06	512K/3.2		$25
CanDpener	1.1	512K/3.0		Free
Canvas	2.1	1MB/6.0		*
Capture	3.0	1MB/6.0		$15
Central System Manager	2.1	1MB/5.0x		*
Chameleon	3.0	512K/3.2		Free
Chemintosh II		1MB/6.0.2		Free
ChromaScan	2.0	6MB/6.0.5		*
Claris CAD	2.0	2MB/6.0		$79
Codecheck	2.0	1MB/6.0		Free
Colorset ★	1.5	1MB/6.0	6/90	Free
CompileIt	1.5	1MB/6.0.2		$30
CompuServe Navigator ★	3.0	512K/3.2		*
ConcertWare	5.1	512KE/4.2		$35
Control II	1.1	2MB/6.0.4		Free
CopyFlow	2.0	2MB/6.0	6/90	Free
Correct Grammar	2.0	1MB/4.2	9/90	$29.95
Crystal Ball	2.0	512/4.2		$75
Cue	3.0	1MB/6.0.3		*
DacEasy Light Checkbook Accounting	2.0	1MB/6.0.3		*
Data Desk	3.0	512K/4.0.2	6/90	$125
DataMerge	2.0	512K/3.2		Free
dBase Mac ★	1.01	1MB/4.1		Free
Deluxe Music Construction Set	2.5	512K/6.0.2		*
DeskPaint ★	3.0	1MB/4.2	5/90	Free
Developer Stack	3.0	1MB/6.0		$15
DiagramMaker ★	1.1	1MB/6.0.2		*
Digital Darkroom ★	2	1MB/6.0.2		*
DiskDoubler	3.0	1MB/6.0.2	12/90	*
DiskExpress II	2.04	1MB/6.0	11/90	*
DiskFit and Network DiskFit	2.0	1MB/6.0		*
DiskTop	4.0	1MB/6.0	7/90	.*
Display AdBuilder	1.1	1MB/6.0.3		*
DocuComp	1.5	512K/3.0	12/90	$19.95
Dollars and Sense	4.1	512KE/3.2		*
Double Helix	3.5	1MB/6.0		*
DragonWave	2.0	1MB/6.03		Free
Dreams	1.1	1MB/6.0.2		*
DynaPerspective	2.0	2MB/6.0.4		Free
DynoDex ★	1.21	1MB/6.0	6/90	Free
Easy Color Paint	2.0	1MB/6.0.2	9/90	*
Empower II ★	3.03	1MB/4.2		Free
EndLink	1.1	512K/3.2		Free
EndNote Plus		512KE/3.2		$49
Exodus	2.0	1MB/6.0		$50
Extender GrafPak	3.0	1MB/6.0.2		$30
Falcon ★	2.2.1	1MB/3.2		$3
Fastback II	2.1	512KE/4.1		$30
Fast Forms	2.0	1MB/6.0	11/90	$25
FastLabel	2.0	1MB/6.0		$36
FastTrack	1.5	512KE/5.5		$20
FaxGate ★	1.1.2	1MB/6.0		Free
Ferrari Grand Prix ★	1.6	512K/3.2		$10
FetchIt	2.0	512K/6.0.1		*
FileMaker Pro	1.0	1MB/4.2	2/91	*
Filevision IV	1.1	1MB/4.2		$15
FilmMaker	2.0	5MB/6.0.3	3/91	*
Finale	2.5	1MB/6.0.2	5/90	$49
Financial Analysis	3.0	512K/3.0		*
Findswell	2.01	512KE/3.2		*
Fontographer	3.1	1MB/4.2	5/90	*
FontShare	2.0	1MB/6.0		Free
FormsProgrammer ★	2.03	1MB/6.0.2		$15
FountainView	3.0	1MB/6.0		$15
FoxBase+/Mac ★	2.10	1MB/6.0		$75
Freedom of Press ★	2.2	1MB/6.0		Free

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Bold *= first time the product is being listed.*

★ *= minor update.*

Req. *= min. RAM and system software required.*

Rev. *= last time (in past year) reviewed this or an earlier version.*

Price *= cost for update to registered owners.*

* *= contact your dealer for update policy.*

PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
FreeFlow	3.0	1MB/6.0.3		Free
Full Impact ★	2.0	1MB/6.0		$50
FullWrite Professional	1.5	2MB/6.0.2		*
Gamblin' Times	3.0	1MB/6.0	3/91	$10
GeoQuery	2.0	1MB/6.0	10/90	*
Gofer	2.0	1MB/4.1		$25
GQL	2.0	1MB/5.0		*
Grammatik Mac	2.0	1MB/5.0	9/90	Free
Great Gantt	1.3	1MB/6.0	12/90	Free
Great Plains Accounting Series	5.2	1MB/6.0		*
HandOff II	1.1	1MB/6.0.2		Free
Handwriting Analyst ★	3.1	512K/3.2		$24.95
Hard Disk Util	3.0	1MB/6.0		$65
Help DA	3.0	1MB/6.0		Free
HFS Backup	3.0	512K/3.2		$35
HydroMac	2.0	1MB/6.0		*
HyperAnimator ★	1.5	1MB/6.0.3		$29.95
HyperCard	2.0	1MB/6.0.3		$49
HyperDA ★	1.2	512K/3.2		$10
HyperEngine Developer's Tool	2.0	1MB/6.0.3		$25
HyperLibrary	2.0	1MB/5.0		*
HyperTools	2.0	2MB/6.0.2		$20
HyperWindows ★	1.2	1MB/6.0.2		$20
Icon-It	2.0	1MB/6.0.2	9/90	$29
if:X Forms Designer	1.1	1MB/6.0	9/90	Free
ImageStudio	1.5	1MB/6.0		$99
ImageWriter LQ Print Driver★	2.0	512K/3.2		Free
In-CAD	2.0	2MB/6.0		*
InfoLogic Envelope ★	1.1c	512KE/4.0		$5
Insight Expert Accounts Payable	2.2	1MB/6.0		*
Insight Expert Accounts Receivable	2.2	1MB/6.0.2		*
Insight Expert General Ledger	2.2	1MB/4.2		$99
Inspiration	2.0.5	1MB/4.2	11/90	Free
Instant-Expert Plus	3.0	1MB/5.0		Free
JetLink Express	2.0	1MB/6.0		$30
KidsTime ★	1.2	512K/3.2		$15
KiwiEnvelopes	3.0	512KE/4.1		$10
Language Systems Fortran★	2.1	2MB/6.0.4		Free
LapLink Mac III	3.0	512K/2.0	7/90	*
LaserPaint Color II ★	1.02	1MB/6.0.3		Free
LetraStudio	1.5	2MB/6.0		$45
LetrTuck+	2.0	512K/3.2		$20
Lightspeed Color Layout System	2.0	1MB/6.0		*
Lookup	2.0	1MB/6.0	5/90	$15
Mac86	2.0	1MB/6.0.2		$10
Mac286	2.0	1MB/6.0.2		$10
Mac3270	2.0	1MB/6.0.3		*
MacAnalyst	2.0	2MB/6.0		$125
MacArchitrion	4.0	2MB/6.0.3		Free
MacAtlas Paint	2.0	512K/3.2		$35
MacClassAds	4.0	1MB/6.0		*
MacConcept	3.0	1MB/6.0.3		*
MacDesigner	3.0	2MB/6.0		$125
MacDraft	2.1	2MB/6.0.2	12/90	*
MacDraw II	1.1	1MB/6.0		*
MacEnvelope	5.0	512KE/3.2		$25
MacEnvelope Plus	2.0	512KE/3.2		$50
Macintosh Yellow Pages	1.1	1MB/6.0		*
MacFalcon	2.1	1MB/6.0.3		*
MacFlow ★	3.1.5	1MB/6.0.3		Free
MacFortran	2.4	512K/4.2		*

Product	V.	Req.	Rev.	Price
MacFortran/020	2.4	512K/4.2		*
MacFortran for MPW	1.1	2MB/6.0.2		Free
MacInUse	3.0	1MB/6.0		$30
MacLinkPlus/PC	4.5	1MB/6.0.2		*
MacLinkPlus/Wang VS	4.0	512KE/3.2		$45
MacLotto	2.1	512K/4.0		$10
MacMainFrame 3270/CUT	2.1	2.5MB/6.0.2		$100
MacMoney	3.5	512KE/4.0		$12
MacPhonebook	3.0	1MB/6.0		*
MacProject II	2.1	1MB/6.0		Free
MacProof ★	3.2.1	1MB/6.0.2		$30
MacRascol	2.0	2MB/4.1		$25
MacRecorder	2.0	512K/3.2		*
MacroMind Director	2.0	2MB/6.0.2	10/90	$100
MacSafe II		512KE/4.2	10/90	*
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MacSchedule	2.0	1MB/6.0		$30
MacSmarts	4.0	1MB/6.0		*
MacTell	3.5	512K/3.0		*
MacTerminal ★	3.0	512K/3.2		$65
MacVision Video Digitizer	3.1	1MB/6.0.2		$50
MacWrite II	1.1	1MB/6.0		Free
Managing Your Money	4.0	1MB/6.0.3	6/90	*
MapGrafix	2.0	4MB/6.0.3		Free
Maple	4.2.1	1MB/6.0		*
MarcoPolo	1.1	1MB/6.0		Free
MarketMaster	II+	1MB/6.0.3		$25
MarkUp	1.02	1MB/6.0	5/90	Free
Master Tracks Pro 4	4.12	1MB/4.1	6/90	$45
MathCAD ★	2.06	1MB/6.0.2		Free
MathType	2.1	512K/6.0.2		*
Matlab	1.2	1MB/3.0		*
MaxPage ★	1.2	512K/3.2		Free
McClint	2.0	1MB/4.2		$25
McCPrint	2.1	512K/4.2		$25
McMax	2.0	1MB/5.0		*
MGMStation ★	2.5	512KE/3.0		*
MiBAC Jazz Improvisation	1.2.2	1MB/6.0	11/90	Free
MicroPhone II	3.0	512K/4.2	7/90	*
Microsoft Excel	2.2	1MB/6.0.2		*
Microsoft File	2.0	512K/3.2		*
Microsoft Mail	2.0	1MB/6.0.2		*
Microsoft PowerPoint	2.01	1MB/6.0		Free
Microsoft Word	4.0	512KE/3.2		*
Microsoft Works	2.0	512K/6.0		*
MindWrite ★	2.1	512KE/4.2		*
MiniCad Plus	3.0	1MB/6.0		*
MiniDraw	4.0	512KE/4.2		$17
MockPackage Plus Utilities	4.4	512KE/3.2		$15
ModelShop	2.0	1MB/6.0.2		*
Modern Artist	2.0	2MB/6.0.2		$150
Monte Carlo	2.2	1MB/6.0.3		$60
More ★	3	1MB/4.1	12/90	*
MSFL: Pro League Football	2.0	1MB/6.0		*
Multi-Ad Creator	2.2	2MB/6.0.3		*
MultiClip	2.0	512K/6.0.2	8/90	*
MultiLedger ★	1.1	512K/3.2		Free
MusicProse	1.01	1MB/6.0		Free
Music Publisher	2.5	1MB/6.0		*
M.Y.O.B.	2.0	1MB/6.0		*
MyDiskLabeler III		1MB/6.0		$25
MyTimeManager	2.0	1MB/6.0	5/90	*
NanoDisk	2.0	4MB/6.0.4		Free
Navigate	2.0	1MB/6.0		Free
Nemesis Go Master	4.0	512K/4.1		*
Network Bundle for the Mac	3.0	512K/3.2	7/90	*

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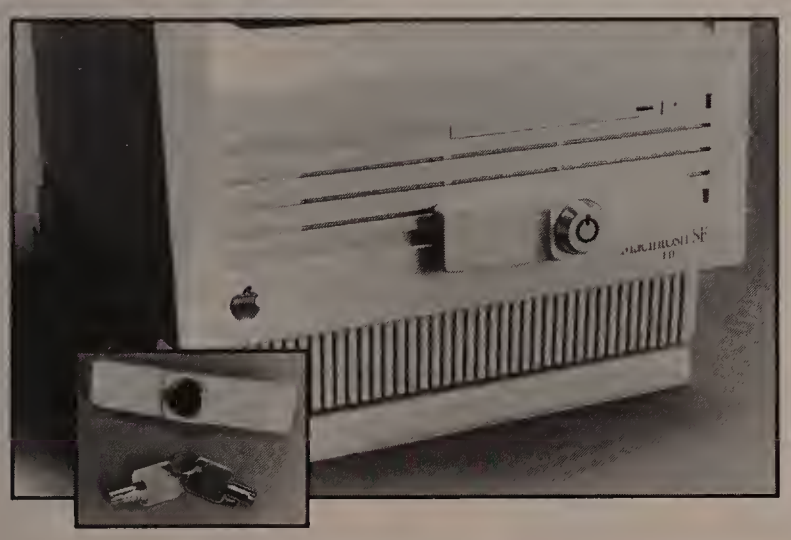

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PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
NetMinder Ethernet	1.1	2MB/6.0		Free
Network DiskFit	1.5	512K/4.1		$30
The NightWatch ★	1.03	512KE/3.2		*
Nisus	3.04	1MB/6.0.2	2/91	Free
Now Utilities	2.0	1MB/6.0.2		$25
NuPaint ★	1.04	512K/3.2		Free
NuTools	1.2	1MB/6.0		*
Nutrition Stack	2.0	1MB/6.0.2		$20
OmniPage ★	2.1	1MB/6.0.2		Free
Omnis 3 Plus/Express	2.0	512KE/3.2		*
On Schedule	2.0	1MB/3.0		*
P51 Mustang Flight Simulator	2.80	512K/3.2		$10
PacerLink	5.0	512K/5.0		*
Panorama	1.5	1MB/4.2		$29.95
Paper Keyboard	1.2	2MB/6.0.3		$25
PEGASYS II	3.2	1MB/6.0.3		Free
Performer Sequencer	3.5	1MB/6.0		Free
Personal Golf Stats	2.0	512K/3.2		Free
Personal Phone ★	1.1	1MB/6.0		*
Personal Reference Catalog	2.0	1MB/6.0	10/90	$10
Phonenet Liaison	3.0	1MB/4.2		$75
PhotoMac	1.5	2MB/6.0.3		$75
PhotoMacEdit	1.5	2MB/6.0.3		$30
The Phrase Thesaurus	2.0	1MB/6.0		Free
PICT Detective	2.0	512KE/6.0		$20
PixelPaint	2.0	2MB/4.1		$99
PixelPaint Pro	2.0	3MB/6.0.3		$125
Plains & Simple ★	1.06	1MB/3.2		*
PostShow	1.1	1MB/6.0		$35
PowerOraw	3.0	1MB/6.0		*
PowerStation ★	2.5.2	512K/4.1		Free
PowerTools	3.0	4MB/6.0		*
Practica Musica	2.1	512K/3.2		$10
Printer Interface III	2.0	512K/6.0.2		$22.50
Pro-Cite ★	1.3	512K/4.1		*
Professional Composer	2.3	1MB/6.0.3		Free
Professional Image II	2.0	1MB/6.0		$22
The Programmer's Online Companion	2.0	1MB/6.0.2		$10
Prograph	2.0	2MB/6.0	8/90	*
Property Management III		1MB/6.0.1		$100
PropsForms	2.0	1MB/6.0.3		Free
Prototyper ★	2.01	1MB/4.1		$79
Publish-It	1.2	512KE/5.0		*
Publish It Easy	2.0	1MB/6.0	9/90	*
Publish or Perish	5.0	512K/4.2		$10
Pyro	4.0	512K/4.1	7/90	$15
Q-Sheet A/V	2.0	1MB/6.0	10/90	$50
QuarkXPress	3.0	2MB/6.0.5	11/90	$30
Quicken ★	1.5	512K/5.0		$30
QuicKeys²	2.0.1	1MB/6.0.2	1/91	$49.95
QuickLetter	1.1.2	1MB/6.0		$30
QuickLock	2.0	512KE/3.2	10/90	Free
QuickMail	2.2	512KE/3.2		$95
QuickShare	2.0	512KE/3.2		$75
QuickShot ★	2.1	1MB/4.2		$5
RagTime 3	3.04	2MB/6.0	8/90	$150
Read-It OCR Personal	2.1	1MB/6.0.3		$29
Read-It OCR Professional	3.0	2MB/6.0.3		*
ReadySetGo	4.5	1MB/6.0		*
Real Estate Edge	2.0	1MB/6.0.3		Free
Rendezvous	2.5	512KE/4.1		$15
Reports ★	1.2	1MB/6.0		Free
Retail Engine	3.0	1MB/6.0		*
Sales and Market Forecasting Toolkit	2.0	1MB/6.0		$49
Sales Associate	1.10	1MB/6.0.3		Free
SAM	2.0	1MB/6.0	2/91	$29.95
ScanMan Model 32		1MB/6.0	10/90	Free
ScheduleMaker ★	3.01	1MB/6.0		$25
ScreenSnap ★	2.2	1MB/4.2		*
ScriptEdit	2.0	1MB/6.0.4		$25
Sentinel	2.2	1MB/6.0		$30
Shanghai	2.0	1MB/6.0.2		$13
Shortcut	1.5	1MB/6.0		Free
SimMac	3.1	1MB/6.0.2		Free
SimpleSpan	2.5	512K/3.2		*
Smart Alarms & Appointment Diaries	3.1	1MB/6.0.2	12/90	$25
Smart Alarms & Multi-User Appointment Diaries	3.01	1MB/6.0.2	12/90	*
SmartForm Assistant	1.1	1MB/6.0		Free
SmartForm Designer	1.1	1MB/6.0		Free
SmartScrap & The Clipper	2.0	1MB/6.0.3		$20
Snap ★	3.1	1MB/3.0		*
SnapJot	3.0	512K/4.1		*
SoftPC ★	1.3	2MB/6.0		*
Sound Designer Universal ★	1.5	512K/6.0.3		$45
Spelling Coach Professional	3.1	512KE/4.2		*
Spellswell ★	2.2	512K/3.2	5/90	$20
Spinnaker Plus	2.0	2MB/6.0		$45
Springboard Publisher	2.0	1MB/6.0		*
Stepping Out II	2.0	1MB/4.1		Free
StickyBusiness	1.06	512KE/6.0.3		Free
StrataVision 3d	2.0	2MB/6.0.3	4/90	$99
StuffIt Classic	1.6	1MB/6.0		*
Suitcase II	1.2.6	512KE/4.1		$25
Super 3D	2.1	512KE/6.0.2		Free
SuperANDVA	1.1	1MB/6.0.2	5/90	Free
SuperGlue II with GlueNotes	2.1	1MB/6.0		*
SuperLaserSpool	2.0.2	1MB/6.0		$30
SuperPaint	2.0	1MB/6.0.2		$50
SuperSpool	5.0	512K/4.1		$30
Sybil	2.0	1MB/6.0	11/90	*
Synchronicity	2.5	512KE/3.2		$10
Systat	5.0	4MB/6.0		$190
Teacher's Rollbook ★	2.2	512K/3.2		$17.95
Tempo II	1.02	1MB/4.2		*
Tempo+ Tools ★	1.1	1MB/4,2		*
Ternary Plot	3.0	512K/3.2		*
TextPert ★	3.01	1MB/6.0		Free
TextScan	3.04	1MB/6.0		$69.95
TGRAF-07/Mac	2.0	2MB/6.0		*
Theorist	1.1	1MB/6.0		*
Think C	4.0	1MB/5.0		*
Think Pascal	3.0	1MB/5.0	11/90	$69
ThunderWorks	1.0.3	1MB/6.0.2		$69
Timbuktu	3.1	1MB/4.1	10/90	*
Timbuktu/Remote	2.0	1MB/4.1		*
TimeMinder	2.0	1MB/4.2		$50
Timeslips III	2.0	1MB/6.0.2		*
TML Pascal II	3.0	1MB/5.0		$79.95
Trapeze ★	2.1	1MB/6.0		$35
TrueBASIC ★	2.02	1MB/6.0		Free
TrueForm ★	1.1	1MB/6.2		Free
TurboCASE	2.0	1MB/6.0		$25
Turbosynth	2.0	1MB/6.0.3		$35
Typeface Library	1.5	1MB/6.0.3		*
TypeStyler	1.5	1MB/4.1	7/90	*
UNITize ★	1.3	512KE/3.2		$20
UpBeat	2.01	1MB/6.0	8/90	$75
VersaCAD/ Macintosh Edition ★	2.11	1MB/6.0		Free
Vietnam War	2.0	1MB/6.0		*
Virex	3.0	1MB/4.2		$25
Virtual 2.0 for 030	2.03	1MB/4.2		Free
Virtual 2.0 for Mac II	2.03	1MB/4.2		Free
Virtual 2.0 for Mac Plus	2.02	1MB/4.2		Free
Vision	1.1	1MB/6.0.3		Free
VMacS	2.0	1MB/6.0		$25
Voyager	1.2	1MB/6.0		*
Wall Street Investor	3.0	1MB/5.0		$150
White Knight II	11.6	1MB/6.0.2	7/90	$35
Wild Things ★	1.1	1MB/6.0		Free
WillMaker	4.0	512KE/4.2	3/91	$18.50
Wingz ★	1.1	1MB/6.0		Free
Word Finder	2.0	512K/3.2		*
WordPerfect for the Macintosh	2.0	1MB/4.2		*
WorksPlus Command	2.0	2MB/6.0.3		$35
WorksPlus Spell	2.0	1MB/6.0.3		$35
WriteNow	2.2	512K/4.2	9/90	$49

To have products listed in this section, send upgraded software, an outline of changes since the previous release (indicate if it's a maintenance upgrade), upgrade price, minimum RAM and system software, suggested retail price, company name, mailing address, and phone number to *Updates, Macworld,* 501 Second St., San Francisco, CA 94107.

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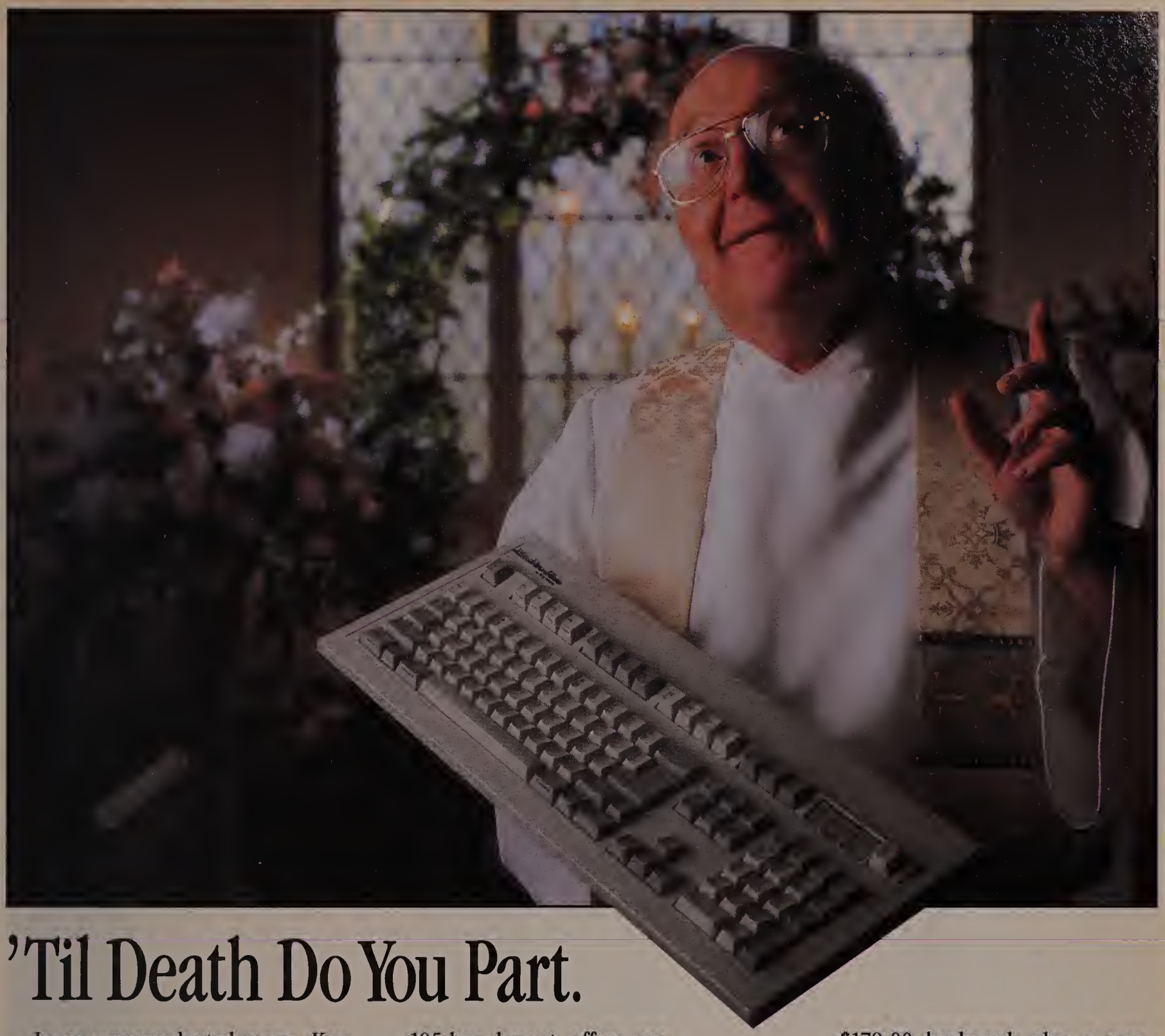

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WHERE TO BUY

A Guide to Products Featured in This Issue

This listing provides companies and phone numbers for products mentioned in this issue. Allow several weeks for responses to reader service card inquiries. Asterisks indicate vendors who prefer to be contacted by phone.

Reader Service

A

601 **Adobe Illustrator, Adobe Photoshop** Adobe Systems; 415/961-4400, 800/344-8335; fax 415/961-3769.
603 **Adobe Type Manager** Adobe Systems; 415/961-4400, 800/344-8335; fax 415/961-3769.
604 **Aldus FreeHand** Aldus Corp.; 206/628-2320; fax 206/343-3360.
605 **Alge-Blaster Plus** Davidson & Associates; 213/534-4070, 800/545-7677; fax 213/534-3169.
* **Algebra I Homework Tutor** Missing Link Software; 201/721-2569.
* **AutoMac III** Microsoft Corp.; 206/882-8080, 800/426-9400; fax 206/883-8101.

B

606 **Ballet Tutor** Shan-Yee Poon Ballet School; 415/759-6199.
607 **Bayshore Blast** Duke University Press; 919/684-6837; fax 919/684-8644.
609 **The Book of MIDI** Opcode Systems; 415/369-8131; fax 415/369-1747.
610 **Brainstorm series** Brainstorm; 415/964-2131; fax 415/964-2135.
611 **Bubble Help for HyperCard** Randal Jones; 22307 65th Ave. W, Mountlake Terrace, WA 98043.
612 **Bus Adaptor Card** Pinnacle Sales International; 408 559-8544, 800/622-1722.

C

613 **CD Companion to Beethoven's Ninth Symphony** The Voyager Company; 213/451-1383, 800/446-2001; fax 213/394-2156.
614 **Color MacCheese** Delta Tao Software; 408/730-9336; fax 408/730-9337.
615 **ColorStudio** Letraset; 201/845-6100, 800/343-8973; fax 201/845-4708.
616 **Cosmic Osmo** Activision; 415/329-0800, 800/227-6900; fax 415/322-0260.

D

617 **The Dancing Mouse** Wondertree Learning Center; 604/876-5006.
618 **Deck** Digidesign; 415/688-0600, 800/333-2137.
619 **DeskPaint & DeskDraw** Zedcor; 602/881-8101, 800/482-4567; fax 602/881-1841.
620 **DesktopMike** Articulate Systems; 617/876-5236, 800/443-7077; fax 617/661-3278.
621 **Dialoger Professional** theResult Software; 919/490-3292, 800/365-5034; fax 919/490-2903.
* **Disk Accessory Plus** Vertical Solutions; 503/671-0511, 800/222-6032; fax 503/646-8248.
* **Display Net** Electronic Catalog Corp.; 513/241-5270, 800/777-7770.
622 **DoubleTime-16** Aox; 617/890-4402, 800/232-1269; fax 617/890-8445.

E

623 **Earthquake Preparedness Stack** Gaia Systems; 415/854-8288; fax 415/854-8297.
624 **Earthquest** Earthquest; 415/321-5838; fax 415/322-3817.
625 **Easy Color Paint** Creative Software; 201/665-9361, 800/367-6899.
626 **ELITE Professional Flight Simulator** AzureSoft; 408/947-1121, 800/654-2359; fax 408/947-8595.
627 **El Verbo Simple** Jason Sluzevich; 719/598-4670.

ETHERNET PRODUCTS

628 **3Com Corp.** 408/764-5000, 800/638-3266; fax 408/764-5003.
630 **Apple Computer** 408/996-1010, 800/776-2333; fax 408/974-6726.
631 **APT Communications** 301/831-1182, 800/842-0626; fax 301/874-5255.
632 **Asanté Technologies** 408/734-4844, 800/662-9686; fax 408/734-4864.
633 **Cabletron Systems** 603/332-9400, 603/332-4616.
634 **Cayman Systems** 617/494-1999, 800/473-4776; fax 617/494-9270.
* **Compatible Systems Corp.** 303/444-9532, 800/356-0283; fax 303/444-9595.
635 **Dayna Communications** 801/531-0203, 801/359-9135.
636 **Dove Computer Corp.** 919/763-7918, 800/622-7627; fax 919/251-9441.
637 **Everex Systems** 415/498-1111, 800/821-0806; fax 415/683-2151.
638 **Farallon Computing** 415/596-9100; fax 415/596-9020.
639 **Generation Systems** 408/734-2100; fax 408/734-4626.
640 **MacProducts USA** 512/343-9560, 800/622-3475; fax 512/343-6141.
641 **National Semiconductor Corp.** 408/721-5000; fax 408/970-0905.
642 **Network Resources Corp.** 408/263-8100; fax 408/263-8121.
643 **NetWorth** 214/869-1331; 800/544-5255; fax 214/556-0841.
644 **Nuvotech** 415/331-7815, 800/468-8682; fax 415/331-6445.
645 **Racal Interlan** 508/263-9929, 800/526-8255.
646 **Shiva Corp.** 617/252-6300, 800/458-3550.
647 **Solana Electronics** 619/490-5050; fax 619/490-5055.
648 **Technology Works** 512/794-8533, 800/688-7466; fax 512/794-8520.
649 **Tri-Data Systems** 408/727-3270, 800/874-3282; fax 408/980-6565.
650 **Ungermann-Bass** 800/999-3236.
651 **Webster Computer Corp.** 408/954-8054; fax 408/954-1832.
652 **The Wollongong Group** 415/962-7100, 800/962-8649, 800/872-8649 in California.

F

653 **FasTrack** Computer System Associates; 619/566-3911; fax 619/566-0581.

H

655 **Hyper-ABLEDATA** Trace Research and Development Center; 608/262-6966; fax 608/262-8848.
656 **HyperMailbox** Kenji Takeuchi; 312/241-6322.
* **HyperRegister** George Pytlik; 604/533-4706.

I

657 **interFACE** Bright Star Technology; 206/451-3697; fax 206/454-1062.

(continues)

Reader Service

L

658 **La Cie Tsunami 80-Q** La Cie, a Plus Development Company; 503/691-0771, 800/999-0143; fax 503/692-8289.

659 **The Lazy Eye: A Primer of Neuro-ophthalmology** Howard Bregman; 215/898-9840.

660 **LCDevice, LCDisplay** Dynamac Computer Products; 303/296-0606, 800/234-2349; fax 303/296-9540.

661 **LessonCard** C.H. Love & Co.; 915/676-1109, 800/527-4248; fax 915/676-1534.

662 **Liberty 80** Liberty Systems; 408/983-1127; fax 408/243-2885.

M

663 **Mac Frog** Bob Doltar; 503/245-1898.

664 **MacGraphX** Bravo Technologies; 415/841-8552.

665 **MacInTax** SoftView; 805/385-5000, 800/622-6829; fax 805/385-5001.

666 **Macintosh IIci Cache Card, Macintosh Display Card 8•24 GC** Apple Computer; 408/996-1010, 800/776-2333; fax 408/974-6726.

668 **Macintosh Upgrade Products** Apple Computer; 408/996-1010, 800/776-2333; fax 408/974-6726.

675 **The Mackerel Stack** Mackerel Design; 416/538-1676.

676 **MacList** JAM Software; 415/663-1041; fax 415/663-8217.

677 **MacPhoneBook** SYNEX; 718/499-6293, 800/447-9639; fax 718/768-3997.

678 **MacRecorder** Farallon Computing; 415/596-9100; fax 415/596-9020.

679 **MacroMaker** Apple Computer; 408/996 1010, 800/776-2333; fax 408/974-6726.

• **Macroscope Ecology Project** 714/659-7811.

680 **MacSprint II** Orchid Technology; 415/683-0300, 800/767-2443; fax 415/490-9312.

681 **Marathon 030 Accelerator** Dove Computer Corp.; 919/763-7918, 800/622-7627; fax 919/251-9441.

682 **MasterColor** Preferred Publishers; 901/683-3383; fax 901/683-4983.

683 **MasterStrokes** Datadesk International; 818/998-4200, 800/826-5398; fax 818/998-0330.

684 **Metromorphosis** Wondertree Learning Center; 604/876-5006.

• **Microsoft Excel Tour** Microsoft Corp.; 206/882-8080, 800/426-9400.

685 **MusiCard Maker** Intellimation; 805/968-2291, 800/346-8355; fax 805/968-8899.

O

686 **Oasis** Time Arts; 707/576-7722; fax 707/576-7731.

• **Offline** SNA; 609/799-9605, 800/628-6442; fax 609/799-9639.

687 **Outdoor and Adventure Vacations** Tourism British Columbia; 800/663-6000. also (604) 387-1642

P

688 **Photon Paint** Micro-Illusions; 818/785-7345; fax 818/787-7345.

689 **PixelPaint** SuperMac Technology; 408/245-2202, 800/624-8999; fax 408/735-7250.

690 **PixelPaint Professional** SuperMac Technology; 408/245-2202, 800/624-8999; fax 408/735-7250.

691 **Power Up** Total Systems; 503/345-7395, 800/874-2288; fax 503/343-6293.

692 **PowerCard 030** DayStar Digital; 404/967-2077, 800/962-2077.

693 **Professor Mac** Individual Software; 415/595-8855,

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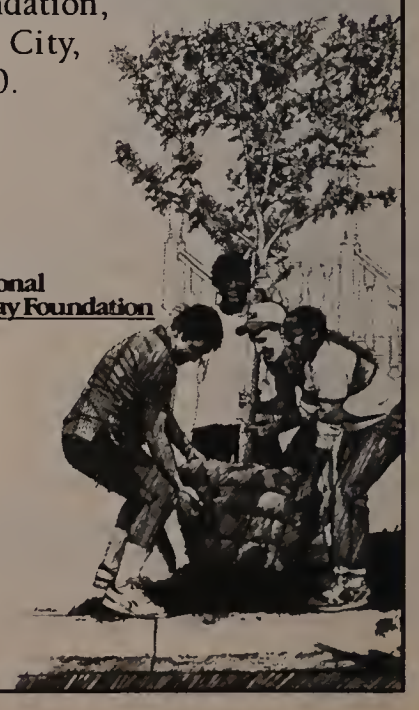

The National Arbor Day Foundation

Reader Service

800/331-3313; fax 415/595-5619.

Q

694 **QuicKeys²** CE Software; 515/224-1995; fax 515/224-4534.

695 **Quik30** Novy Systems; 904/427-2358; fax 904/428-0765.

R

696 **Revolución** Hugo Rosatti, Pontificia Universidad Católica de Chile, Instituto de Historia, Santiago, Chile.

S

698 **ScuzzyGraph series** Aura Systems; 619/438-7730, 800/365-2872; fax 619/447-8982.

699 **Si3033** Siclone Sales & Engineering Corp.; 408/456-5060, 800/767-8207; fax 408/456-0107.

700 **Si3040** Siclone Sales & Engineering Corp.; 408/456-5060, 800/767-8207; fax 408/456-0107.

701 **Si3050** Siclone Sales & Engineering Corp.; 408/456-5060, 800/767-8207; fax 408/456-0107.

* **A Simulation of Acute Myocardial Infarction** Lee Andrews; 419/381-3653.

702 **Software Bridge Macintosh** Systems Compatibility Corp.; 312/329-0700, 800/333-1395; fax 312/670-0820.

703 **SpeedCard** SuperMac Technology; 408/245-2202, 800/624-8999; fax 408/735-7250.

704 **StrataVision Paint** Strata; 801/628-5218, 800/678-7282.

705 **Studio/8, Studio/32** Electronic Arts; 415/571-7171, 800/245-4525; fax 415/570-5137.

* **SuperImage** Image Analysis Research Center; 419/381-3653.

T

707 **Tempo II** Affinity Microsystems; 303/442-4840, 800/367-6771; fax 303/442-4999.

708 **Terremoto** Ian Bertie, Pontificia Universidad Católica de Chile, Instituto de Historia, Santiago, Chile.

709 **TypeChart** Octavo Productions; 604/987-5270; fax 604/987-5787.

U

710 **UltraPaint** Deneba Software; 305/594-6965, 800/622-6827; fax 305/477-5794.

V

711 **VideoPaint** Olduvai Corp.; 305/665-4665, 800/822-0772; fax 305/665-0671.

712 **VideoPaint Pro** Olduvai Corp.; 305/665-4665, 800/822-0772; fax 305/665-0671.

713 **Virtual** Connectix Corp.; 415/324-0727, 800/950-5880; fax 415/324-2958.

W

714 **Wacom SD-510C Tablet** Wacom; 201/265-4226, 800/922-6613; fax 201/265-4722.

715 **WealthBuilder by Money Magazine** Reality Technologies; 215/387-6055, 800/346-2024; fax 215/387-2179.

Y

716 **Your Personal Trainer for the SAT** Davidson & Associates; 213/534-4070, 800/545-7677; fax 213/534-3169. M

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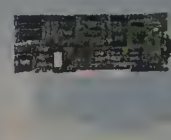

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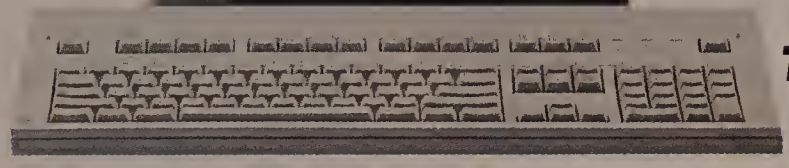

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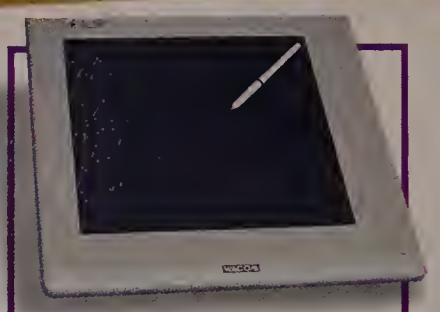

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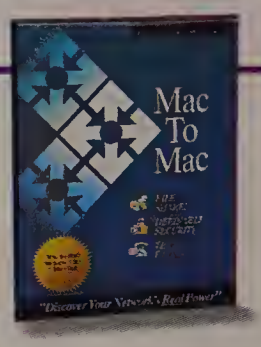

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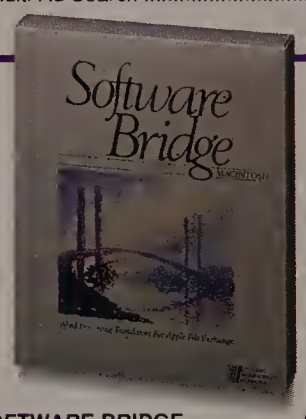

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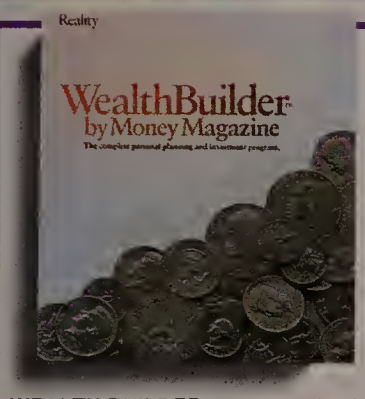

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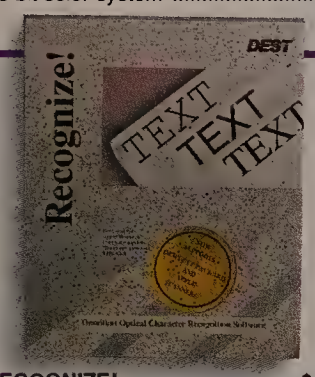

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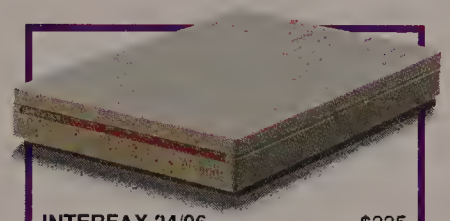

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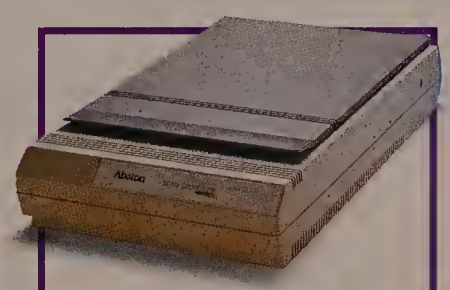

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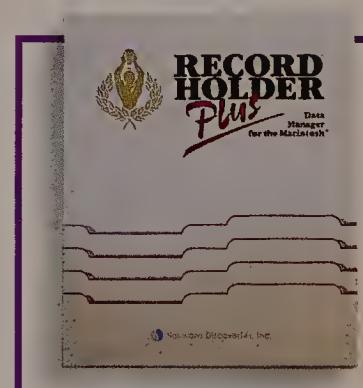

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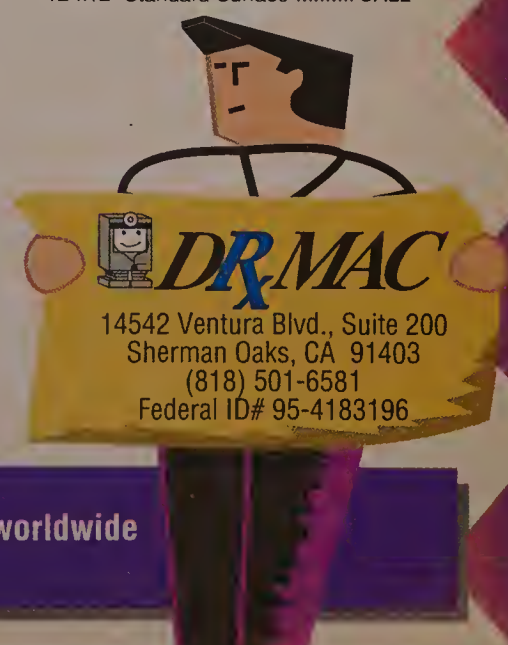

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320(FH)	Imprimis	16	NA	1449
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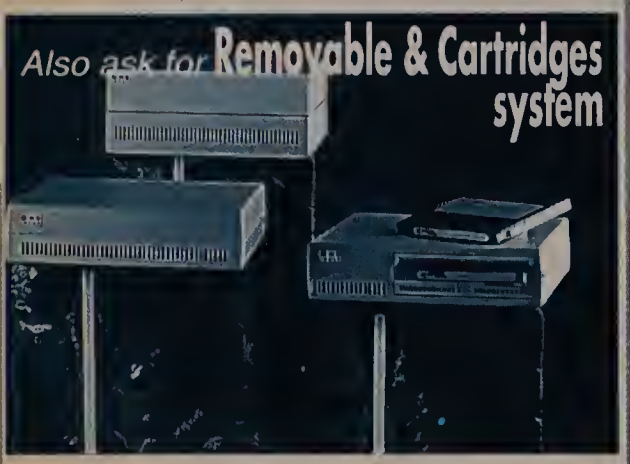

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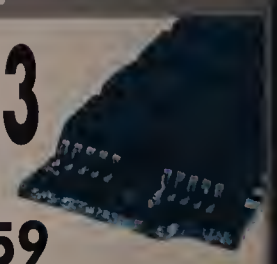

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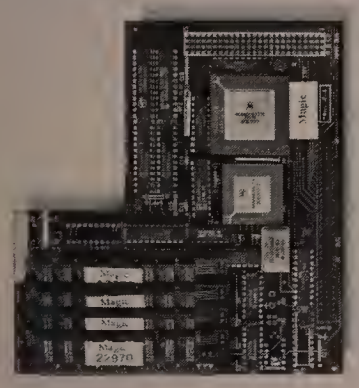

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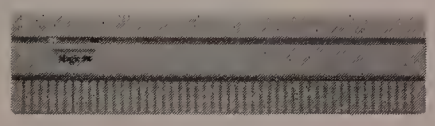

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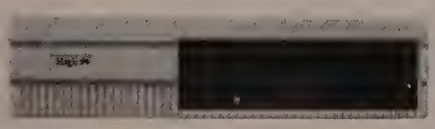

Magic Tape Backup

MagicTape 60	$679
MagicTape 150	$699
MagicTape 525	$999
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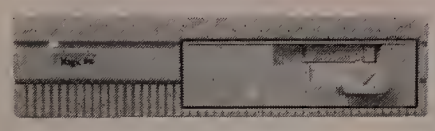

Magic Video

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Magic 19" 8-bit color card for II	$499
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Daystar 40mhz 030 II, IIx/ IIcx	1639/ 1939
Daystar 50mhz 030 II, IIx/ IIcx	2159/ 2559
Daystar FastCache IIci	269
Daystar PowerCache IIci 40mhz	969
Daystar PowerCache IIci 50mhz	1699
Daystar SCSI PowerCard	1109

Connectivity/Network

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Alisa Alisatalk 1/TK50	4249
Asante Maccon+ IIE, ET	345
Asante Maccon+ SE30E	339
Avatar MacMainFrame DX	859
Avatar MacMainFrame II	714
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Insignia SoftPC with AT/EGA	341

Mouse/Keyboard

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CH RollerMouse	80
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AE Ouadralink	199
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Shiva Netmodem V.32	1429
Telebit Trailblazer Plus 19200 BPS	899
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US Robotics Courer V.32/9600	695

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Tektronix ColorQuick InkJet /int	2059
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60 Meg Backup Tape	22
HP DeskJet Cartridges	17
ImageWriter Black Ribbons	3
ImageWriter Color Ribbons	3
ImageWriter Multi Color Ribbon	11
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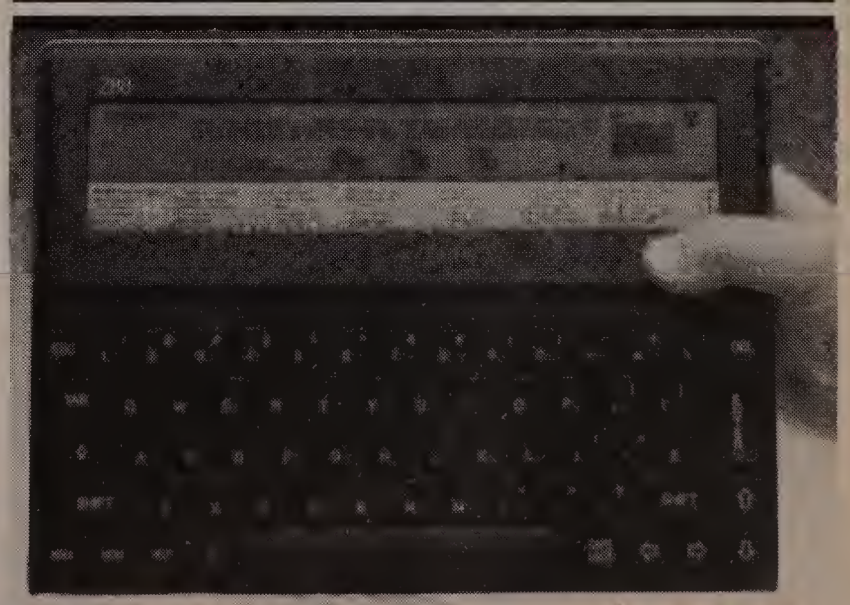

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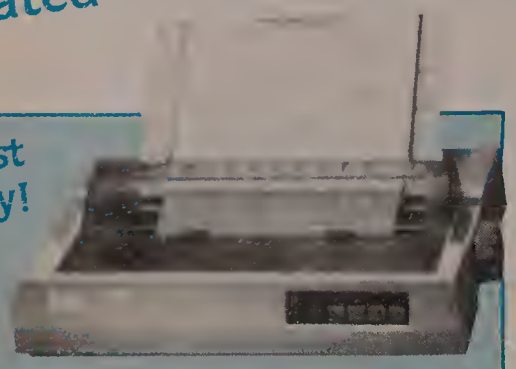

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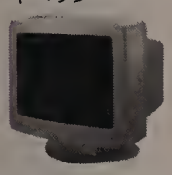

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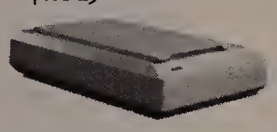

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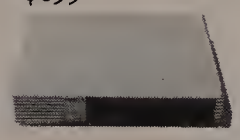

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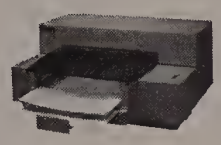

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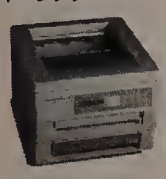

7. Abaton Interfax 24/96
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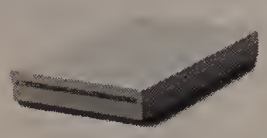

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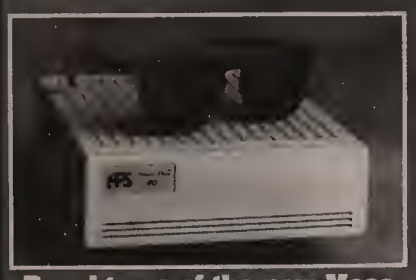

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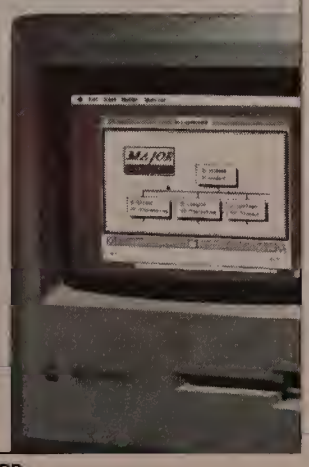

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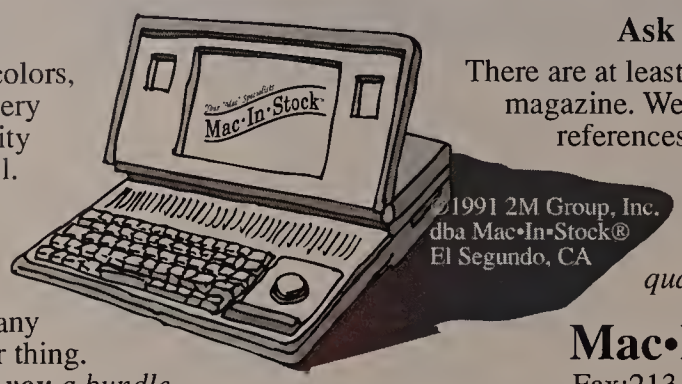

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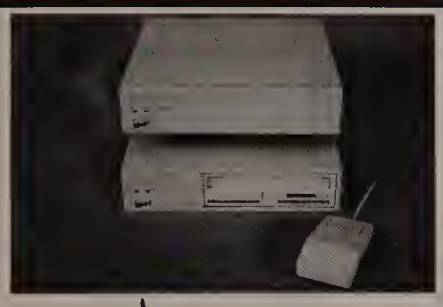

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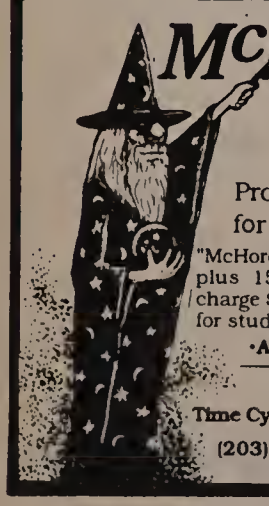

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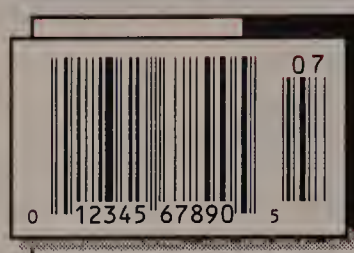

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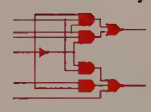

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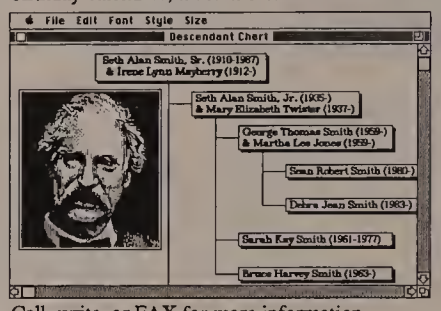

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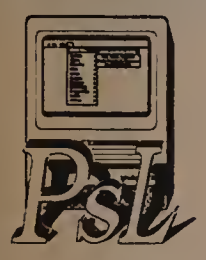

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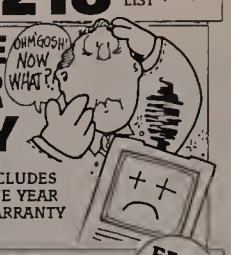

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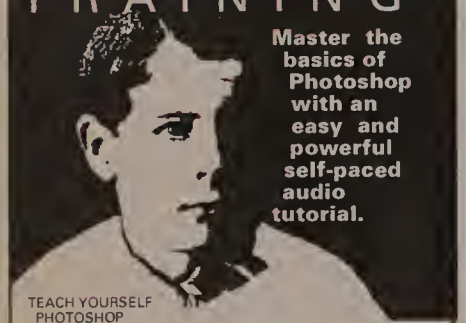
Training

TRAINING



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Furniture

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Mouse Pads

Your Logo Specialist

Qty.	(Lexan— hard surface)	
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36	$5.95 wo/logo	N/A
72	$5.70 wo/logo	$6.50 w/logo
144	$5.15 wo/ logo	$5.20 w/logo
500	$4.80 wo/logo	$4.60 w/logo
1000	$4.48 wo/logo	$4.48 w/logo

Choose your color. Size 8 1/2 x 11 Ask for samples. We specialize in private label. Great promo item. Satisfaction Guaranteed

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Company Logo Specialist

Qty.	Canvas	Hard Surface
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72	5.90 w/logo	N/A
144	4.19 w/logo	5.69 w/logo
500	3.80 w/logo	5.30w/logo
1000	3.49 w/logo	4.99 w/logo

Canvas or Hard Surface in a variety of colors. Size 9.5"x8"x3/8". Multi - color OK. SAMPLES with your logo $12.50. ENTIRE pad imprintable and 100% guaranteed.

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(Macworld Subscriber Study 1990)

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Cloth: 13 Colors

Size:	8x71/4	8x91/2	81/2x11
12 Pads	3.25	3.50	3.75
72	3.00	3.25	3.50
144	2.85	3.00	3.25

PLASTIC: Blue, Platinum, Gray, Red & Black. Size: 81/2x11

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72	5.75	144	5.25

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3.5" Disk Cases - Protects up to **50** Disks
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MWC15

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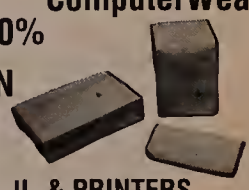
DUST COVERS ComputerWear
100% COTTON CANVAS



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Circle 55 on reader service card.

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You can create calm and beauty where you live, too.
Join me and plant a tree.
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The National Arbor Day Foundation

Let NewGen satisfy your hunger for high-resolution with an affordable 800 dpi printer!

Text for the menu was created in PageMaker, saved as EPS files and placed in FreeHand.

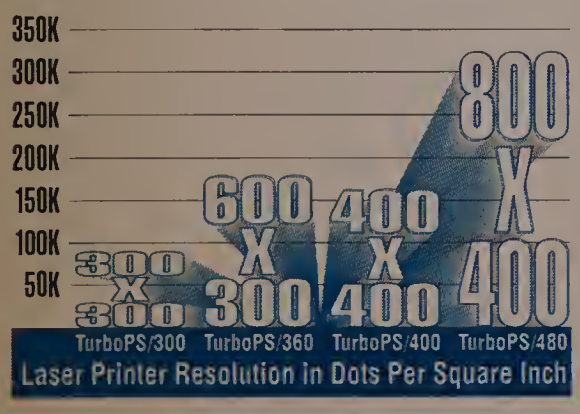
The Images with Impact® clip art illustrations were edited with FreeHand and color was specified in cyan, yellow, magenta and black.

The Apollo logo was created in FreeHand where the various elements were edited and combined.

Add powerful applications like PageMaker®, FreeHand® and Adobe® Type Fonts to produce typeset quality output at your own facility.

The NewGen TurboPS/480 can produce PostScript® language compatible output at 800 x 400 dpi, nearly four times the resolution of other laser printers. And when we say PostScript compatible, we mean it, including Type 1 fonts, special effects and EPS files from all your favorite applications and programs.

The NewGen TurboPS/480 is a complete printer with built-in AppleTalk®, parallel and serial ports. And unlike some printers, it works in mixed Mac-PC environments, and it doesn't require an internal PC processing board or dedicated server.



Resolution close up, 18 point Garamond Italic enlarged 500%

300 x 300 dpi LaserWriter II | **800 x 400 dpi NewGen PS/480** | **600 x 600 dpi Varityper VT-600**

To show you how confident we are that you'll be impressed with 800 x 400 dpi output, we printed this page at actual size, including the menu which was output as color separations.

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Dealer inquiries welcome.

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newgen **NewGen Systems Corporation™**

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Dealers Circle 244 on Reader Service Card **End Users Circle 246 on Reader Service Card**

BEST-SELLERS

BUSINESS SOFTWARE

Months on chart	Last month	This month		
71	1	1	**Microsoft Word**	Microsoft Corporation
62	3	2	**Microsoft Excel**	Microsoft Corporation
50	2	3	**Microsoft Works**	Microsoft Corporation
58	4	4	**Aldus PageMaker**	Aldus Corporation
23	5	5	**FileMaker II**	Claris Corporation
24	7	6	**QuarkXPress**	Quark
47	8	7	**MacWrite II**	Claris Corporation
10	6	8	**Quicken**	Intuit
14	—	9	**Aldus FreeHand**	Aldus Corporation
18	9	10	**Adobe Illustrator**	Adobe Systems

EDUCATION SOFTWARE

25	1	1	**Where in the World Is Carmen Sandiego?**	Brøderbund Software
6	3	2	**Where in Time Is Carmen Sandiego?**	Brøderbund Software
12	4	3	**Where in the USA Is Carmen Sandiego?**	Brøderbund Software
38	2	4	**Reader Rabbit**	The Learning Company
51	5	5	**Math Blaster**	Davidson & Associates

ENTERTAINMENT SOFTWARE

14	1	1	**Tetris**	Spectrum HoloByte
16	2	2	**SimCity**	Maxis Software
1	—	3	**SimEarth**	Maxis Software
8	3	4	**Welltris**	Spectrum HoloByte
24	—	5	**Falcon**	Spectrum HoloByte

NETWORK/DATA COMMUNICATIONS

50	1	1	**TOPS**	Sitka Corporation
45	2	2	**AppleShare**	Apple Computer
9	—	3	**MicroPhone II**	Software Ventures
7	3	4	**Timbuktu**	Farallon Computing
4	4	5	**White Knight**	FreeSoft

MASS STORAGE*

Months on chart	Last month	This month		
14	1	1	**MacStack SD40**	CMS Enhancements
29	2	2	**MacStack SD20**	CMS Enhancements
16	5	3	**MacStack SD30**	CMS Enhancements
2	—	4	**UltraDrive 45**	GCC Technologies
1	—	5	**MacStack SD45**	CMS Enhancements

ADD-IN BOARDS

5	2	1	**Macintosh Display Card 8•24**	Apple Computer
7	5	2	**Radius TPD Interface**	Radius
6	1	3	**Pivot**	Radius
4	—	4	**Radius Direct Color24**	Radius
3	—	5	**Radius Accelerator 16/SE**	Radius

UTILITY SOFTWARE

12	1	1	**SAM II**	Symantec Corporation
12	2	2	**SUM II**	Symantec Corporation
6	3	3	**The Norton Utilities for the Macintosh**	Symantec Corporation
11	—	4	**Adobe Type Manager**	Adobe Systems
4	5	5	**Macintosh Tools Deluxe**	Central Point Software

PRODUCT WATCH

Recent or forthcoming products of particular interest.

Meeting Maker *On Technology*
Group calendaring software

SpaceShip Warlock *Reactor*
Interactive science fiction adventure on CD

FontMonger *Ares Software Corporation*
Font-format conversion between PostScript and TrueType

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order vendors. Covers sales during December 1990.

*Does not include hard drives installed at the factory.

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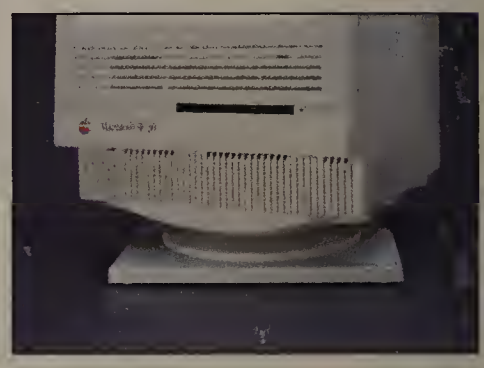

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